TITAN 1080p-500, 1080p-250

High Brightness Digital Video Projector
16:9 widescreen display

User Manual



107-280A

Declaration of Conformity

Directives covered by this Declaration

2004/108/EC Electromagnetic Compatibility Directive.

2006/95/EC Low Voltage Equipment Directive.

Products covered by this Declaration

Large screen video projector type	*The CE mark was first applied in:*
TITAN 1080p-500,	June 2007

Basis on which Conformity is being declared

The products identified above comply with the protection requirements of the above EU directives, and the manufacturer has applied the following standards.

EN 55022:1998 - Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

EN 55024:1998 - Limits and Methods of Measurement of Immunity Characteristics of Information Technology Equipment.

EN 55103:1997 - Product family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control apparatus for Professional Use.

EN 60950:2001 - Specification for Safety of Information Technology Equipment, including Electrical Business equipment.

The technical documentation required to demonstrate that the products meet the requirements of the Low Voltage directive has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities.

Signed: 

Authority: D.J. Quinn, Product Development Director

Date: 25 June 2007

Attention!

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures are available on request, and are also contained in the product manuals.

Declaration of Conformity

Directives covered by this Declaration

2004/108/EC Electromagnetic Compatibility Directive.

2006/95/EC Low Voltage Equipment Directive.

Products covered by this Declaration

Large screen video projector type	*The CE mark was first applied in:*
TITAN 1080p-250	June 2007

Basis on which Conformity is being declared

The products identified above comply with the protection requirements of the above EU directives, and the manufacturer has applied the following standards.

EN 55022:1998 - Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment.

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Important Information

Please read this user manual carefully before using the projector, and keep the manual handy for future reference.

A serial number is located on the side of the projector. Record it here:

Symbols used in this guide

Warnings

ELECTRICAL WARNING: this symbol indicates that there is a danger of electrical shock unless the instructions are closely followed.

WARNING: this symbol indicates that there is a danger of physical injury to yourself and/or damage to the equipment unless the instructions are closely followed.

NOTE: this symbol indicates that there is some important information that you should read.

Trademarks

- IBM is a registered trademark of International Business Machines Corporation.
- Macintosh and PowerBook are registered trademarks of Apple Computer, Inc.
- Other product and company names mentioned in this user's manual may be the trademarks of their respective holders.

Product revision

- Because we at Digital Projection continually strive to improve our products, we may change specifications and designs, and add new features without prior notice. Projectors built prior to this revision of the User Manual may therefore not include all the features described.

Manual revision

Date	Description	Revision
July 2007		Rev A

General precautions

Do not open the cabinet. There are no user serviceable parts inside.

Use only the power cable provided.

Ensure that the power outlet includes a Ground connection, as this equipment MUST be earthed.

Take care to prevent small objects such as paper or wire from falling into the projector. If this does happen, switch off immediately, and have the objects removed by authorised service personnel.

Do not expose the projector to rain or moisture, and do not place any liquids on top of the projector.

Unplug before cleaning, and use a damp, not wet, cloth.

Do not touch the power plug with wet hands.

Do not touch the power plug during a thunder storm.

Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.

There are no user-serviceable parts inside the lamp module. The whole module should be replaced.

Take care when removing the lamp module.

NEVER touch the lamp or reflector.

Take care not to touch the glass surface of the lamp module. If you do accidentally touch the glass, it should be cleaned before use. (see section 5. Maintenance.)

Do not use the lamp for more than 1500 hours, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

HID lamps produce high intensity light. Do not look directly at the light coming from the lamp housing, or the lens, or allow items such as magnifying lenses to be placed in the light path. This could result in serious eye damage.

Do not touch the ventilation outlets, as they will become hot in use.

Do not cover or obstruct the ventilation outlets or inlets.

Do not cover the lens whilst the projector is switched on. This could cause a fire

Always allow the projector to cool for 5 minutes before disconnecting the power, moving the projector or changing the lamp.

Never use strong detergents or solvents such as alcohol or thinners to clean the projector and lens.

Notes

Installation precautions

Connect the LAN cable only to a computer LAN connection. Other similar connectors may have a dangerously high voltage source.

The projector must be installed only by suitably qualified personnel, in accordance with local building codes.

The projector should be installed as close to the power outlet as possible.

The power connection should be easily accessible, so that it can be disconnected in an emergency.

Ensure that there is at least 30cm (12in) of space between the ventilation outlets and any wall, and 10cm (4in) on all other sides.

Do not install the projector close to anything that might be affected by its operational heat, for instance, polystyrene ceiling tiles, curtains etc.

The projector weighs approximately 27 kg (50 lbs). Use safe handling techniques when lifting the projector.

When stacking projectors, the stack MUST be vertical, to ensure that the stresses are distributed to all frame couplings.

Before installation, make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of the projector and lens (see specification for exact weights)**.**

Separate backup safety chains or wires should always be used for each projector.

Do not place heavy objects on top of the projector chassis. Only the chassis corners and the rigging frame are capable of withstanding the weight of another projector.

Do not stack more than 3 projectors.

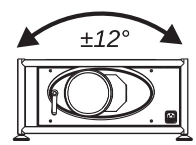
Do not drop or jarr the projector.

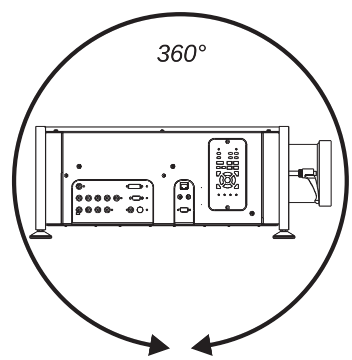
The lens release lever should always be set to the locked position to prevent the lens from falling out.

Place the projector in a dry area away from sources of dust, moisture, steam, smoke, sunlight or heat.

Do not tilt the projector more than ±12° from side to side when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement. The projector my be tilted forwards and backwards as necessary.

Notes





Operation and configuration precautions

Do not make changes to the networking configuration unless you understand what you are doing, or have taken advice from your Network Manager. If you make a mistake, it is possible that you will lose contact with the projector. Always double-check your settings before pressing the APPLY button. Always keep a written note of the original settings, and any changes you have made.

Software update should NOT be carried out except by, or with the supervision of, Digital Projection Service personnel.

Compliance with international standards

Noise

GSGV Acoustic Noise Information Ordinance

The sound pressure level is less than 70 dB (A) according to ISO 3744 or ISO 7779.

RF Interference

FCC

The Federal Communications Commission does not allow any modifications or changes to the unit EXCEPT those specified by Digital Projection in this manual. Failure to comply with this government regulation could void your right to operate this equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

This equipment contains an FCC approved RF transmitter module with FCC ID: R68WIPORT.

European Waste Electrical and Electronic Equipment (WEEE) Directive

Digital Projection Ltd is fully committed to minimising Waste Electrical and Electronic Equipment. Our products are designed with reuse, recycling and recovery of all components in mind. To this end, at end of life, your projector may be returned to Digital Projection Ltd or its agent so that the environmental impact can be minimised.

Notes

Digital Projection Contact details

Notes

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Fax (USA) 770 420 1360

Email powerinfo@digitalprojection.com

Web Site www.digitalprojection.com

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1. Introduction

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What's in the box?

- Make sure your box contains everything listed. If any pieces are missing, contact your dealer.
- You should save the original box and packing materials, in case you ever need to ship your Projector.



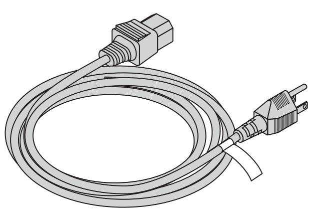
Projector
(1080p-500: 106-241)
(1080p-250: 106-242)

Notes

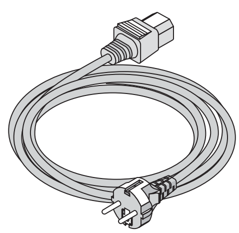
Lenses are optional. Order lenses from your Digital Projection dealer.

For more detailed information about lenses, see **Choosing a lens,** *in* **section 2. Installation***.*

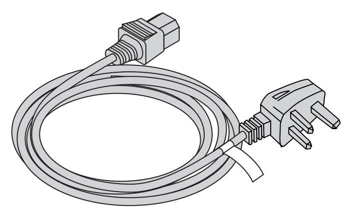
Only one power cable - dependent on the destination territory - will be supplied with the projector.



Power cable 10A
Europe
(102-163)



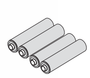
Power cable 13A
North America
(102-165)



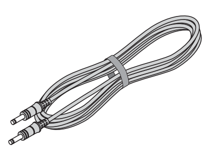
Power cable 10A
United Kingdom
(102-180)



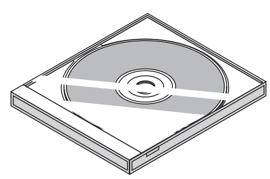
Remote control
(105-023)



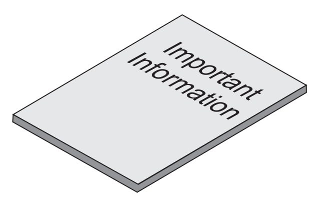
4x AAA batteries
(105-922)



Remote cable 5m
(102-162)



User manual on CD
(105-923D)



Important Information
(105-924C)

Key features of the projector

Congratulations on your purchase of the Digital Projection Titan 1080p-500 or 1080p-250 projector.

Digital Projection International, Texas Instruments' first DLP™ partner and the original innovator of the 3-chip DLP™ projector, proudly introduces the Titan 1080p. Incredibly bright, high resolution and high in contrast, the Titan 1080p offers a radically new electronics configuration ideally suited for the staging and large-venue permanent installation markets.

The Titan 1080p harnesses the power of the Texas Instruments' 1920 x 1080 pixel HPO DMD's™. Alongside the LIGHTNING and HIGHlite Pro, the Titan 1080p is to set new standards for Staging and is destined to be the first choice of professionals who stage prestigious events such as the Grammy® Awards and the Oscars®. With a contrast of up to 5000:1 and awe-inspiring brightness of up to 6000 lumens, the Titan 1080p is unmatched for applications as diverse as world class staged events, commercial entertainment, major outdoor venues, large-scale simulation, gaming, home theatre and houses of worship.

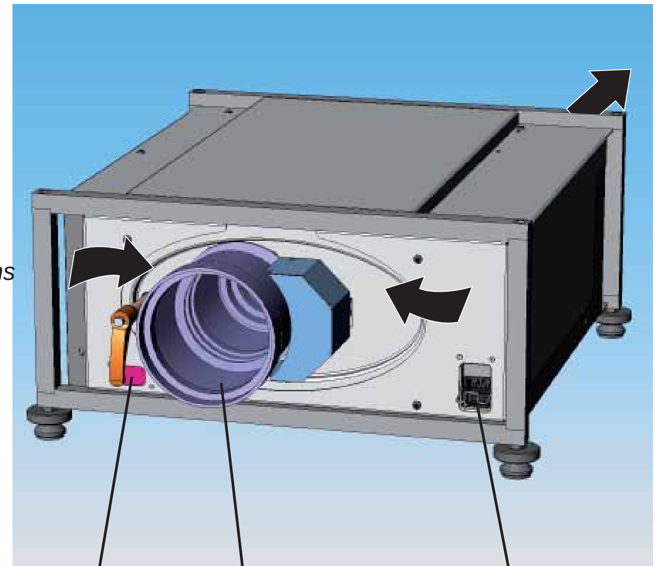
Key Features

- High resolution, large venue projector
- Applications: Large Screen; Fixed install and Rental
- 1080p-500: 6000 ANSI lumens ±10%
  1080p-250: 2000 ANSI lumens ±10%
- 1080p-500: Contrast >2000:1 ±10%
  1080p-250: Contrast >5000:1 ±10%
- 1920 x 1080 resolution
- Precision mechanical design ensuring maximum amount of light from lamp housing reaches optics, without any operator adjustment
- 1080p-500: 750W single phase, 100-240VAC ±10%
  1080p-250: 500W single phase, 100-240VAC ±10%
- Compact size, light weight - approximately 27 kg (50 lbs)
- Motorised lens mount
- Optional Rigging frame with Quick-lock stack system- 3 point pitch & roll adjustment for accurate alignment
- Ruggedised robust metal case
- LAN & RS232 connection for network operation
- Six selectable Digital and Analogue Video inputs for display of the latest as well as legacy video standards.
- DVI, RGBHV, Component, S-Video, Composite all as standard
- Wi-fi connection wireless remote control
- IR/cable remote control for easy setup
- LAN operation using control codes or Integrated Userware

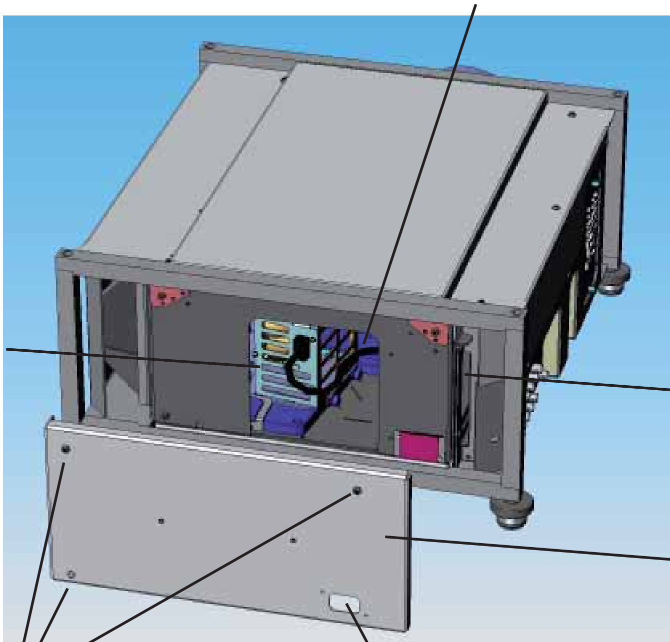
Notes

Getting to know the projector

Front panel, – lens and power



Rear panel – lamp and air filter

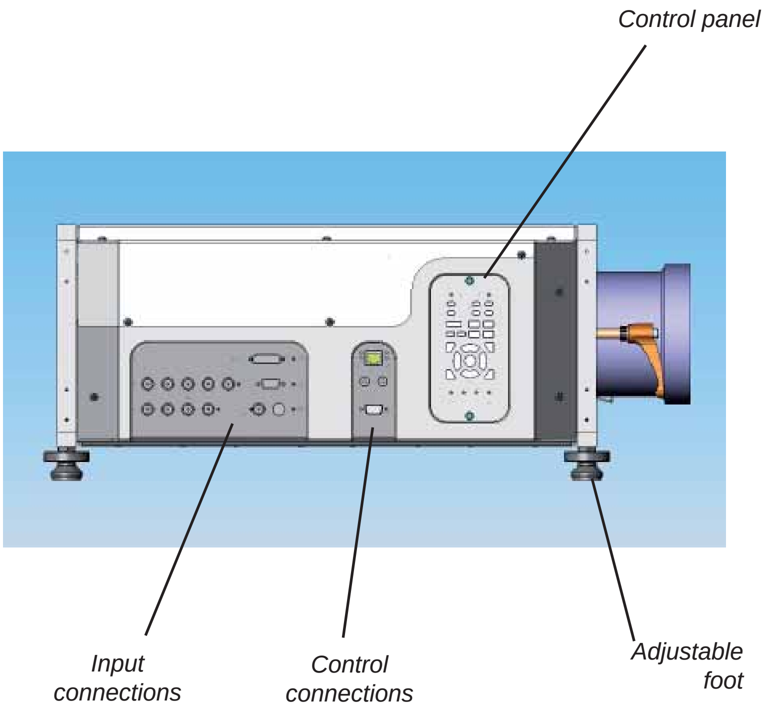


Notes

For more detailed information about lenses, see **section 2. Installation**

For information about how to change the lamp or the filter, see ***section*** **6. Maintenance***.*

Side panel – connection and control



Notes

For information about how to connect the projector, see **Connecting the projector** *in section* **2. Installation***, and* ***Connections*** *in section* ***7. Appendix****.*

For information about how to use the control panel, see section **4. Controlling the projector***.*

For information about how to mount and stack projectors, see section **2. Installation***.*

2. Installation

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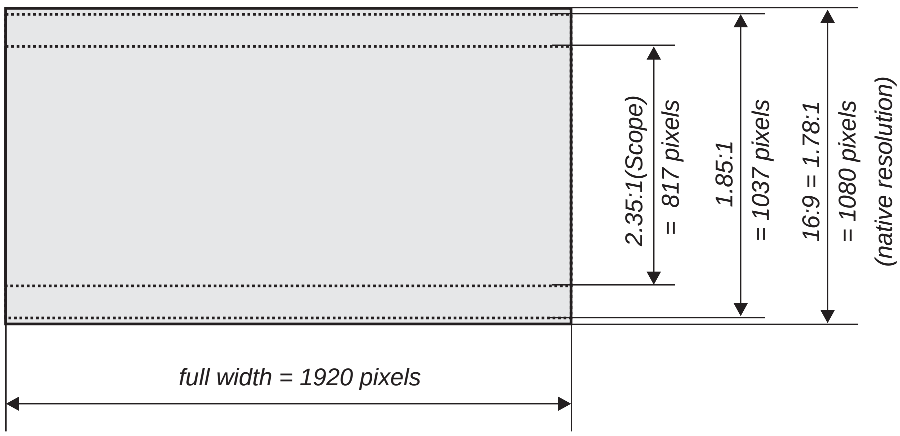
Screen requirements

Aspect ratio

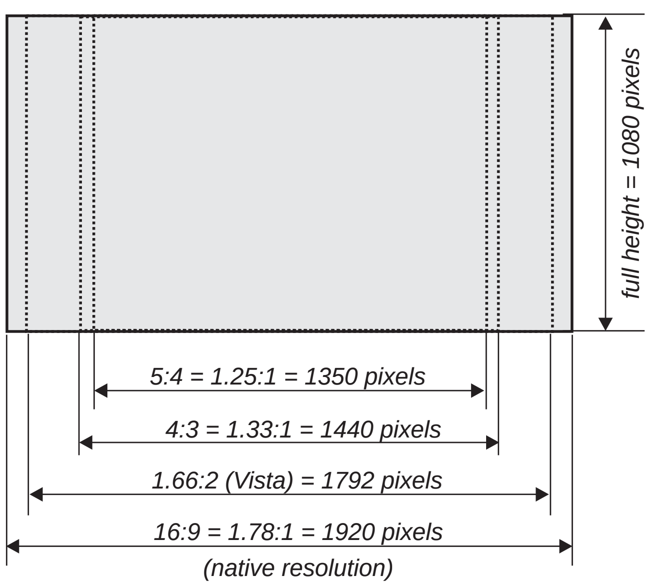
Fitting the image to the DMD

If the source image supplied to the projector is smaller than 1920 x 1080 pixels, then the image will not fill the DMD. The following example shows how a number of common formats may be displayed.

Images displayed full width



Images displayed full height



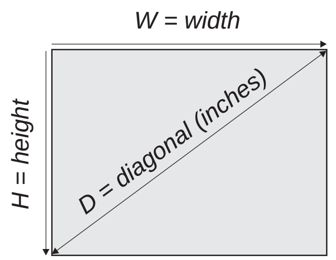
Notes

☞ *The images are shown here scaled automatically by the projector.*

The image may be scaled differently if the Aspect Ratio is set differently in the Picture or Geometry menus.

Diagonal screen sizes

Screen sizes are sometimes specified by their diagonal size (D) in inches. When dealing with large screens and projection distances at different aspect ratios, it is more convenient to measure screen width (W) and height (H).



The example calculations below show how to convert diagonal sizes in inches into width and height, at various aspect ratios.

2.35:1 (Scope)
W = D x 0.92in (D x .023m) ***H*** = D x 0.39in (D x .01m)

1.85:1
W = D x 0.88in (D x .022m) ***H*** = D x 0.47in (D x .012m)

16:9 = 1.78:1 (native aspect ratio)
W = D x 0.87in (D x .022m) ***H*** = D x 0.49in (D x .0125m)

1.66:1 (Vista)
W = D x 0.86in (D x .022m) ***H*** = D x 0.52in (D x .013m)

4:3 = 1.33:1
W = D x 0.8in (D x .02m) ***H*** = D x 0.6in (D x .015m)

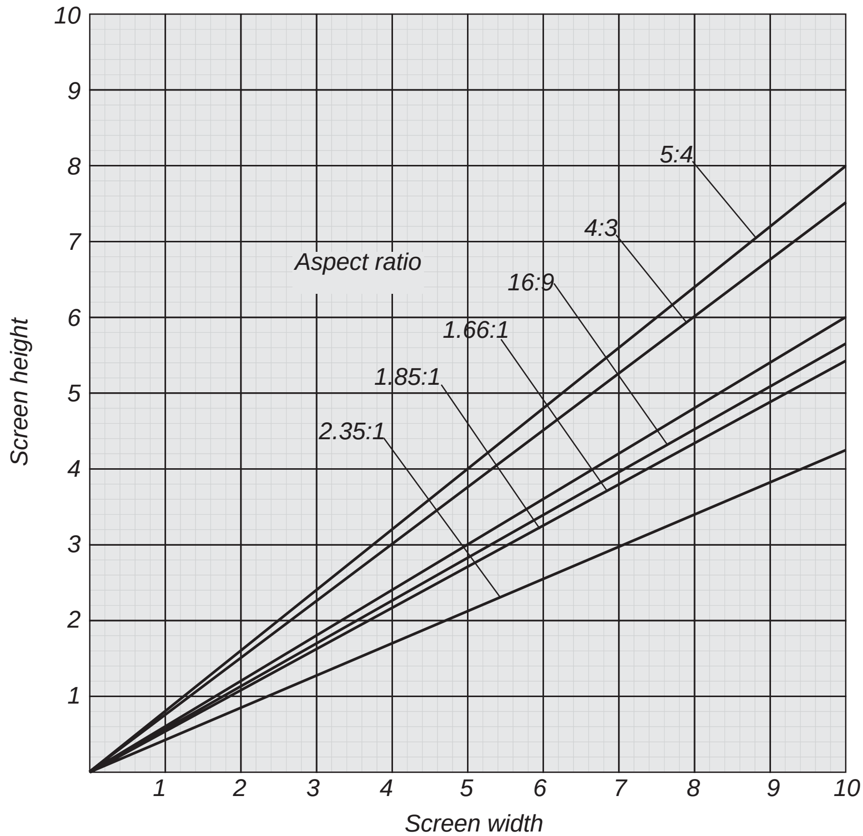
5:4 = 1.25:1
W = D x 0.78in (D x .02m) ***H*** = D x 0.625in (D x .016m)

Notes

Fitting the image to the screen

It is important that your screen is of sufficient height and width to display images at all the aspect ratios you are planning to use.

Use the conversion chart, or the sample calculations below to check that you are able to display the full image on your screen. If you have insufficient height or width, you will have to reduce the overall image size in order to display the full image on your screen.



2.35:1 (Scope)
W = H x 2.35 ***H*** = W x 0.426

1.85:1
W = H x 1.85 ***H*** = W x 0.54

16:9 = 1.78:1 (native aspect ratio)
W = H x 1.78 ***H*** = W x 0.56

1.66:1 (Vista)
W = H x 1.66 ***H*** = W x 0.6

4:3 = 1.33:1
W = H x 1.33 ***H*** = W x 0.75

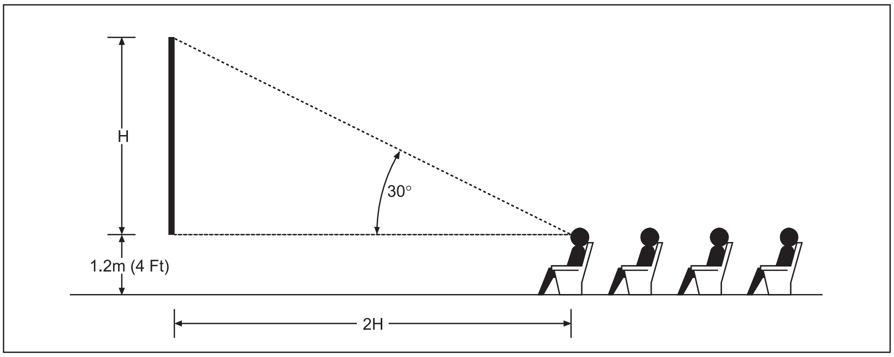
5:4 = 1.25:1
W = H x 1.25 ***H*** = W x 0.8

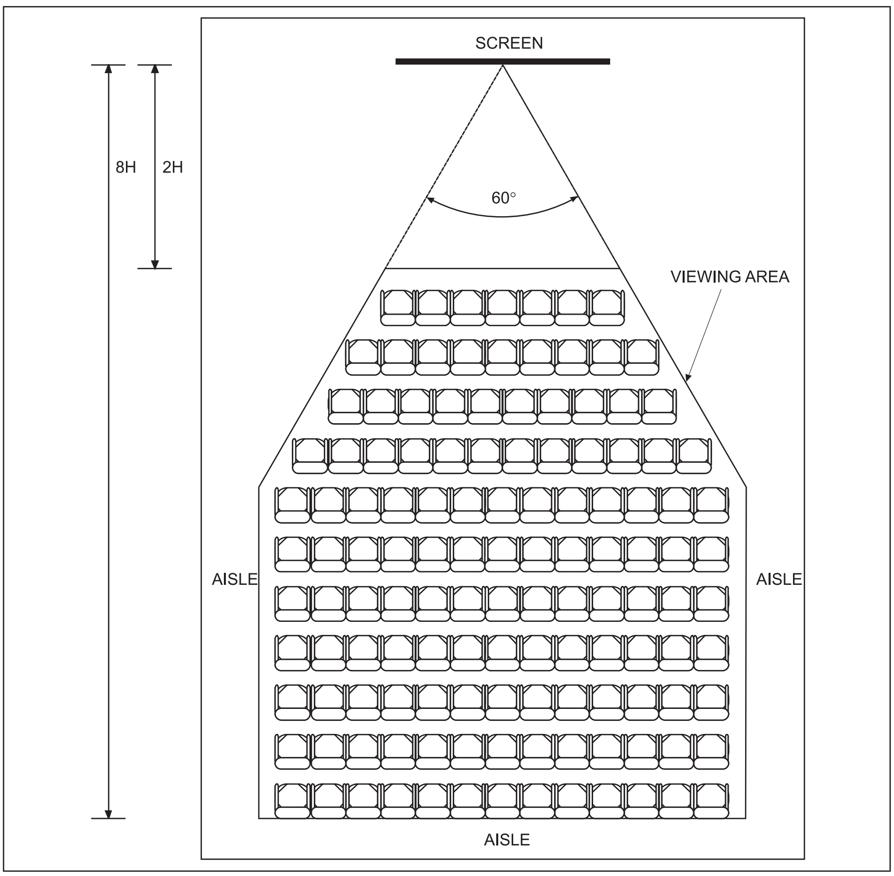
Notes

Positioning the screen and projector

For optimum viewing, the screen should be a flat surface perpendicular to the floor. The bottom of the screen should be 1.2m (4 feet) above the floor and the front row of the audience should not have to look up more than 30° to see the top of the screen.

The distance between the front row of the audience and the screen should be at least twice the screen height and the distance between the back row and the screen should be a maximum of 8 times the screen height. The screen viewing area should be within a 60° range from the face of the screen.





Notes

The projector should be installed as close to the power outlet as possible.

The power connection should be easily accessible, so that it can be disconnected in an emergency.

Ensure that there is at least 30cm (12in) of space between the ventilation outlets and any wall, and 10cm (4in) on all other sides.

Do not install the projector close to anything that might be affected by its operational heat, for instance, polystyrene ceiling tiles, curtains etc.

The image can be flipped for rear projection (see ***section*** **4. Using the menus***,* **Image menu***) and displayed without the need for extra mirrors or equipment.*

However, you must ensure that there is sufficient distance behind the screen for the projector to be correctly located.

Rear installation is generally more complicated and advice should be sought from your local dealer before attempting it.

Choosing a lens

A number of lenses are available for use with the projector. Which lens you choose will depend on the screen size, image aspect ratio, projection distance and light output.

The lenses available and their part numbers are listed below:

	High Brightness	High Contrast
0.67 : 1 fixed lens	105-607	107-195
1.12 : 1 fixed lens (3 - 15m)	105-608	105-608
1.12 : 1 zoom lens (1.2 - 2m)	105-609	105-609
1.39 - 1.87 : 1 zoom lens	105-610	107-196
1.87 - 2.56 : 1 zoom lens	105-611	107-197
2.56 - 4.16 : 1 zoom lens	105-612	107-198
4.16 - 6.96 : 1 zoom lens	105-613	107-199

If you are simply connecting the output of a camera or computer directly to the projector, then the image size (in pixels) may well be fixed. If, however, you are using commercially available image processing equipment, such as the Digital Projection VIP1000, you may be able to resize the image to fit the DMD.

If the image does not fill the full width of the DMD, this effectively increases the throw ratio of the lens. This can be corrected for by applying a Throw ratio factor.

Method one: using the lens charts

For the screen sizes listed below, use the charts on the following pages, to choose the most suitable lens.

Full width images, including:

2.35:1 (Scope) 1920 x 817 pixels

1.85:1 1920 x 1037 pixels

16:9 = 1.78:1 1920 x 1080 pixels (native resolution)

Full height images

A Throw ratio factor (TRF) has been applied to the following charts:

1.66:1 (Vista)	1792 x 1080 pixels	TRF = 1.07
4:3 = 1.33:1	1440 x 1080 pixels	TRF = 1.33
5:4 = 1.25:1	1350 x 1080 pixels	TRF = 1.42

Method two: by calculation

See the calculations, on the page immediately following the lens chart.

Notes

☞ *The High Brightness lenses are recommended for the 1080p-500, for maximum light output.*

The High Contrast lenses are recommended for the 1080p-250, for maximum contrast.

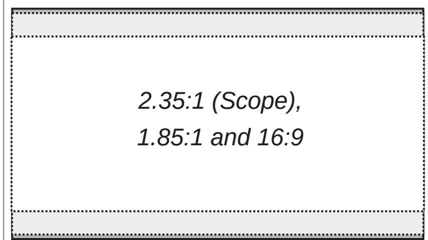
☞ *For more information about Throw ratio factor (TRF), see* **Useful lens calculations***, later in this section.*

Choosing a lens using the lens charts

Use the charts on this page and on the following pages to choose which lens best suits your application.

Notes

This chart has a TRF of 1.0, for use with the following images:

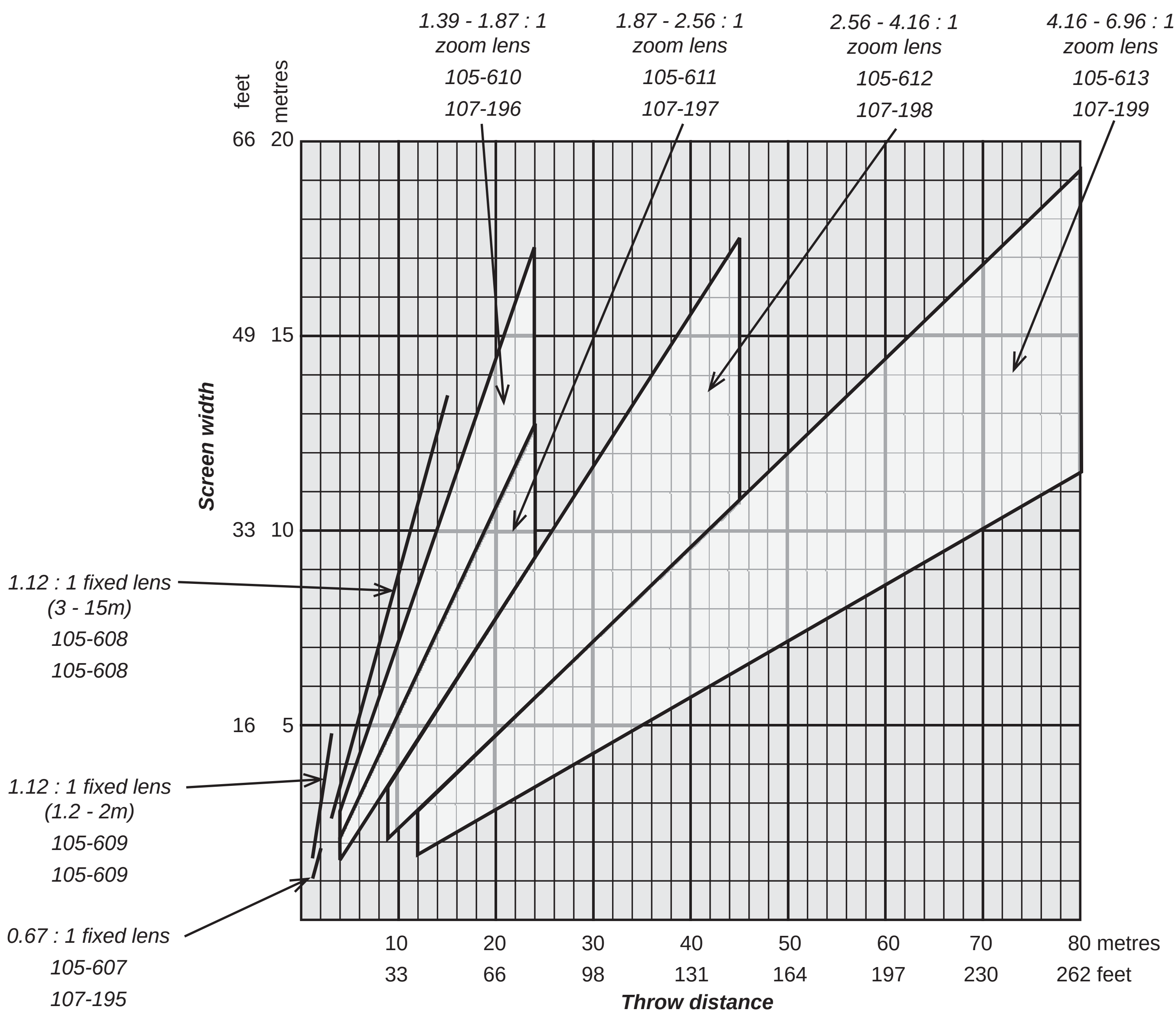


Full width images, including 2.35:1, 1.85:1 and 16:9 (native resolution)

example

- For a screen width of 10m at a distance of 30m, the 2.56- 4.16: 1 zoom lens would be best suited.
- For the same screen size at a distance of 50m, the 4.16 - 6.96: 1 zoom lens would be best suited.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.



Lens charts continued

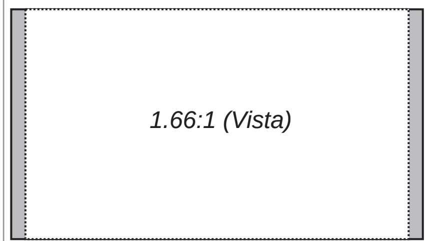
Full height image 1.66:1 (Vista)

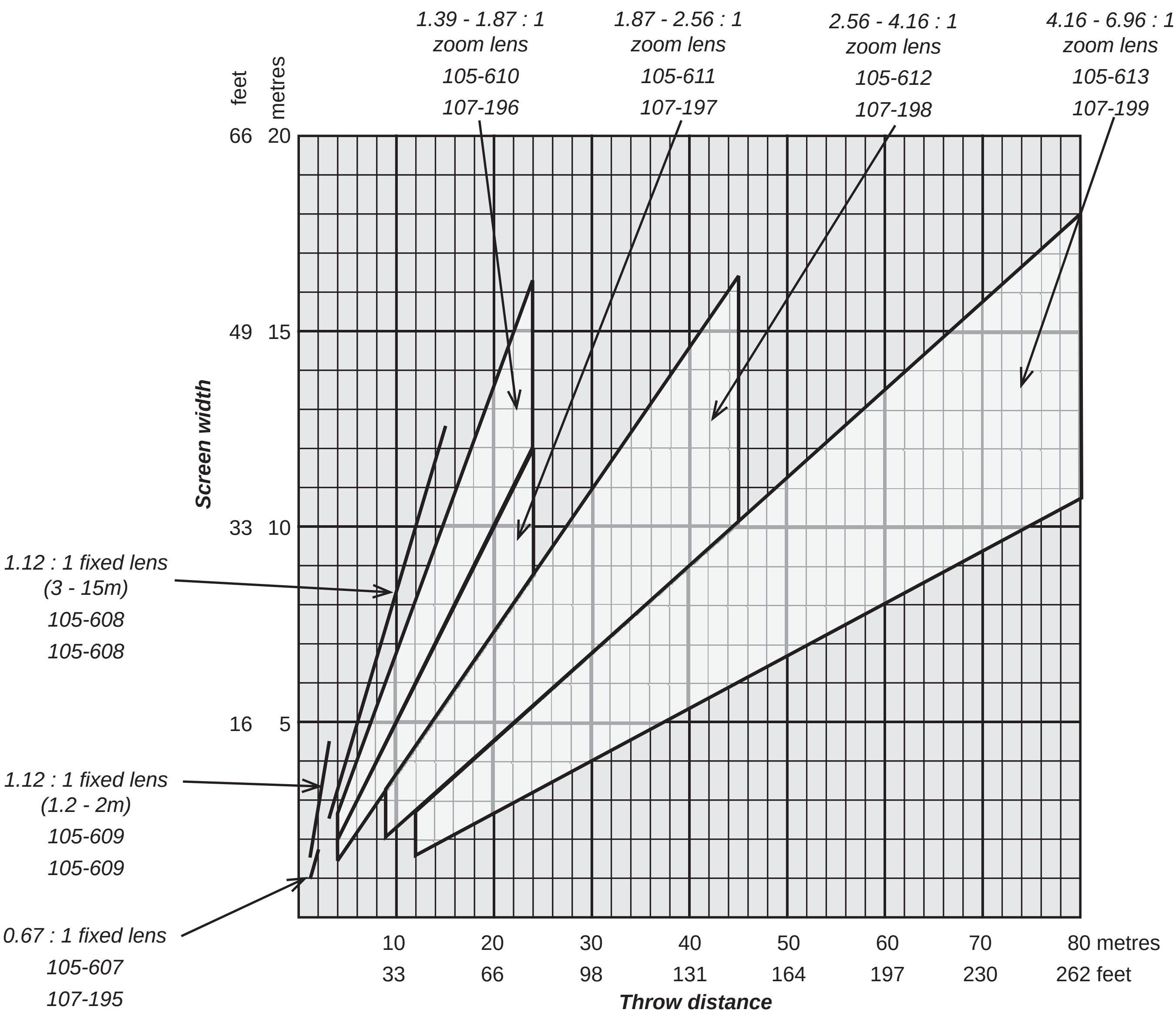
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

☞ *This chart has a TRF of 1.07, for use with the following images:*





Lens charts continued

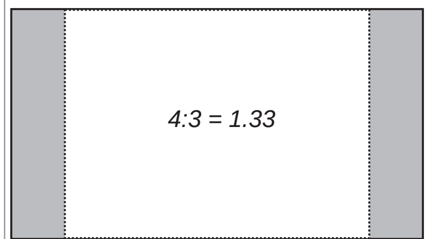
Full height image 4:3

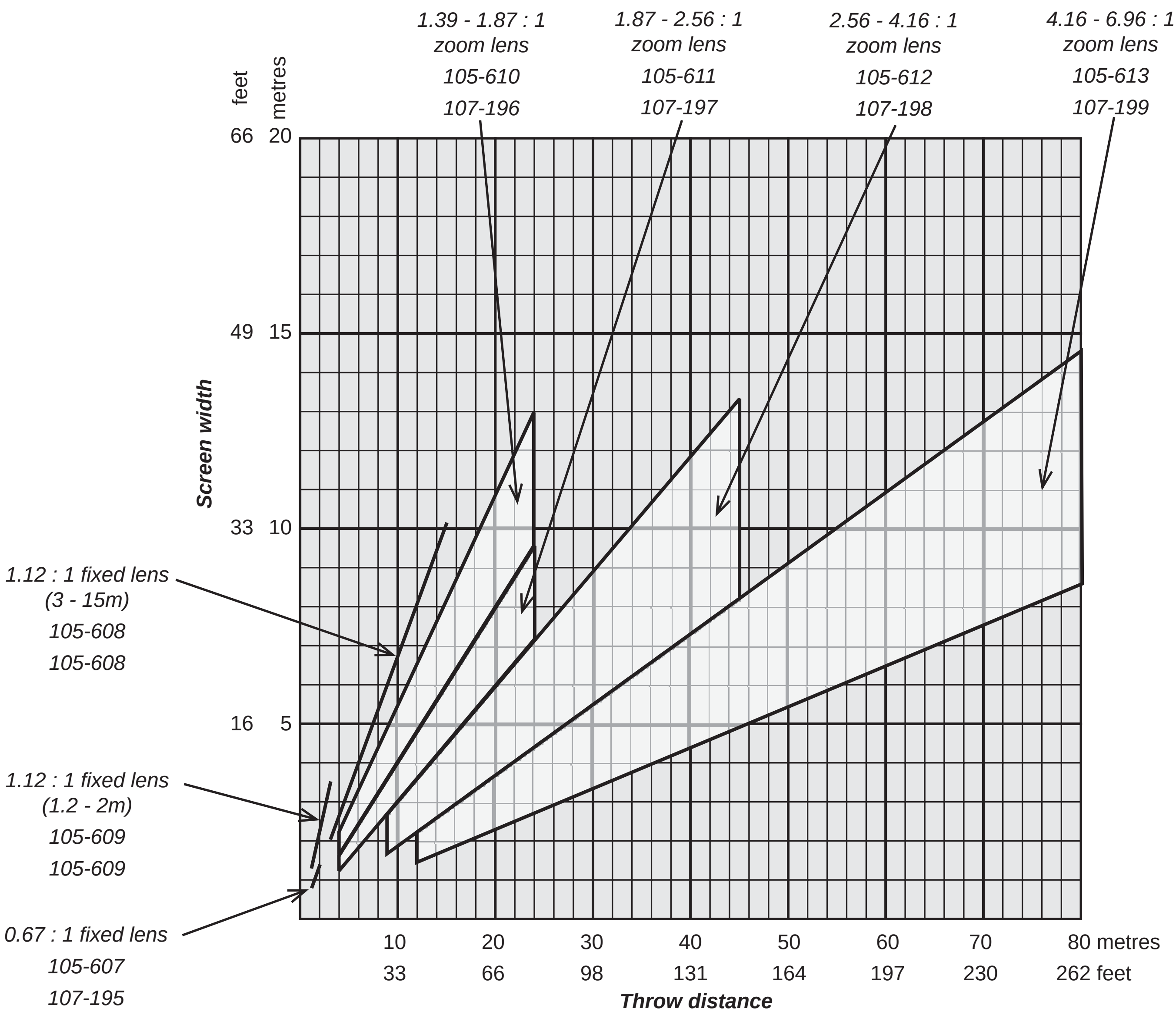
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

☞ *This chart has a TRF of 1.33, for use with the following images:*





Lens charts continued

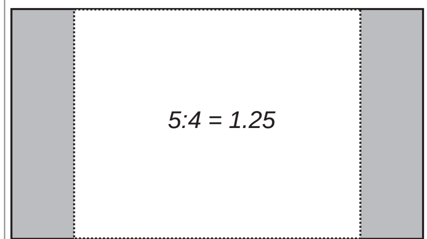
Full height image 5:4

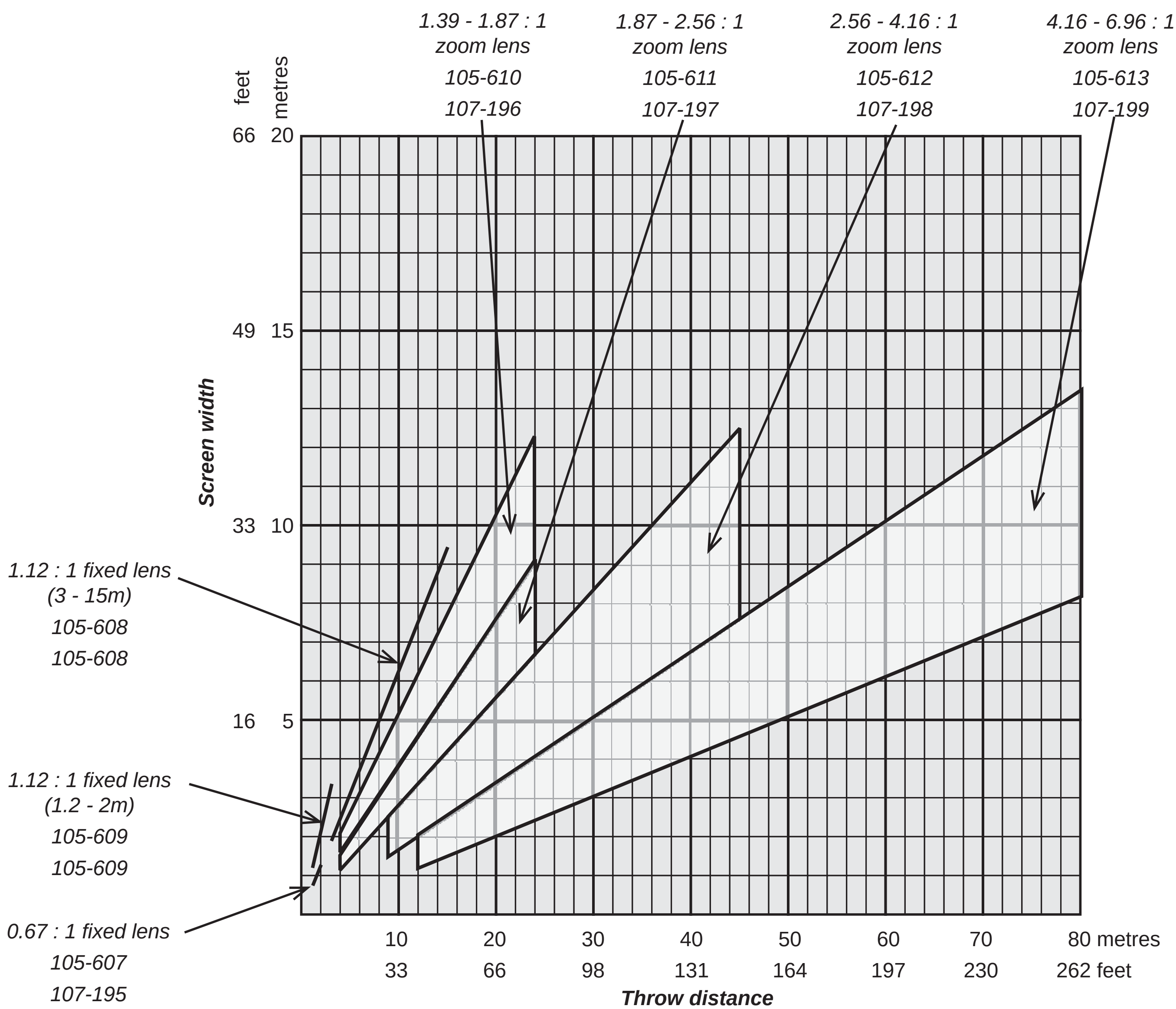
Use the chart below to choose which lens best suits your application.

if you need to be more precise, then use the calculations on the page immediately following the lens charts.

Notes

This chart has a TRF of 1.42, for use with the following images:





Choosing a lens by calculation

For any screen size not listed above, or if you need to be more precise, then use the calculations below.

- Identify actual width of the image in pixels.
- Calculate the Throw Ratio Factor: TRF = DMD width (1920) / Image width in pixels
- Identify the screen width required.
- Identify the throw distance required.

  Throw distance calculations are based on the distance from the outer end of the lens, which will vary from lens to lens. Once a lens has been chosen, the figures can be checked using the lens extension values given on the next page.

- Calculate the throw ratio required. Throw ratio = Throw distance / Screen width x TRF
- Choose a lens with the required throw ratio from the list at the bottom of the page.

  Check from the list that the lens chosen will work at the throw distance required.

example

- An image, 1024 x 768 pixels, screen width 6.5m, throw distance 18m from the outer end of the lens.
- Throw Ratio Factor (TRF) = 1920 / 1024 = 1.875
- Throw ratio required = 18 / 6.5 x 1.875 = 1.48
- Choose the 1.39 - 1.87 zoom lens.

Notes

The Throw ratio for a particular lens is fixed, and assumes that the image fills the width of the DMD.

For images that do not fill the width of the DMD, the Throw ratio is effectively increased. To correct for this, a Throw Ratio Factor (TRF) is used.

	High Brightness	High Contrast	Throw distance range
0.67 : 1 fixed lens	105-607	107-195	1.1 - 3.2m (3.6 - 10.5ft)
0.12 : 1 fixed lens (3 - 15m)	105-608	105-608	3 - 15m (9.8 - 49.2ft)
1.12 : 1 fixeed lens (1.2 - 2m)	105-609	105-609	1.2 - 2m (3.9 - 6.6ft)
1.39 - 1.87 : 1 zoom lens	105-610	107-196	4 - 24m (13.1 - 78.7ft)
1.87 - 2.56 : 1 zoom lens	105-611	107-197	4 - 24m (13.1 - 78.7ft)
2.56 - 4.16 : 1 zoom lens	105-612	107-198	9.1 - 45m (29.9 - 147.6ft)
4.16 - 6.96 : 1 zoom lens	105-613	107-199	12 - 80m (39.4 - 262.5ft)

Useful lens calculations

The following lens calculations may be useful:

Throw ratio = $\frac{\text{Throw distance}}{\text{Screen width}}$

Throw ratio factor (TRF) = $\frac{\text{DMD width in pixels}}{\text{image width in pixels}} = \frac{1920}{\text{image width in pixels}}$

Therefore:

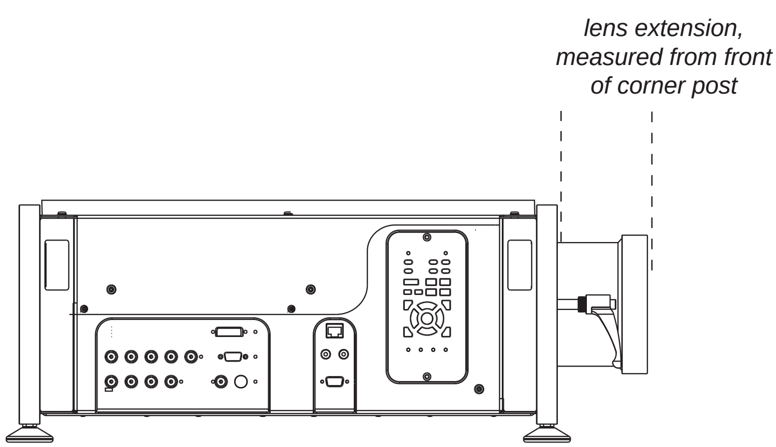
Screen width = $\frac{\text{Throw distance}}{\text{Throw ratio x TRF}}$

Throw distance = Screen width x Throw ratio x TRF

Lens extension

The throw distance calculated above is to the outer end of the lens. For each lens, the nominal distance between the front of the projector and the outer end of the lens (lens extension) will be as listed below.

	High Brightness	Contrast	Lens extension
0.67 : 1 fixed lens	105-607	107-195	204 mm (8.0 in)
0.12 : 1 fixed lens (3 - 15m)	105-608	105-608	268 mm (10.6 in)
1.12 : 1 fixeed lens (1.2 - 2m)	105-609	105-609	268 mm (10.6 in)
1.39 - 1.87 : 1 zoom lens	105-610	107-196	194 mm (7.6 in)
1.87 - 2.56 : 1 zoom lens	105-611	107-197	159 mm (6.3 in)
2.56 - 4.16 : 1 zoom lens	105-612	107-198	152 mm (6.0 in)
4.16 - 6.96 : 1 zoom lens	105-613	107-199	118 mm (4.6 in)



Notes

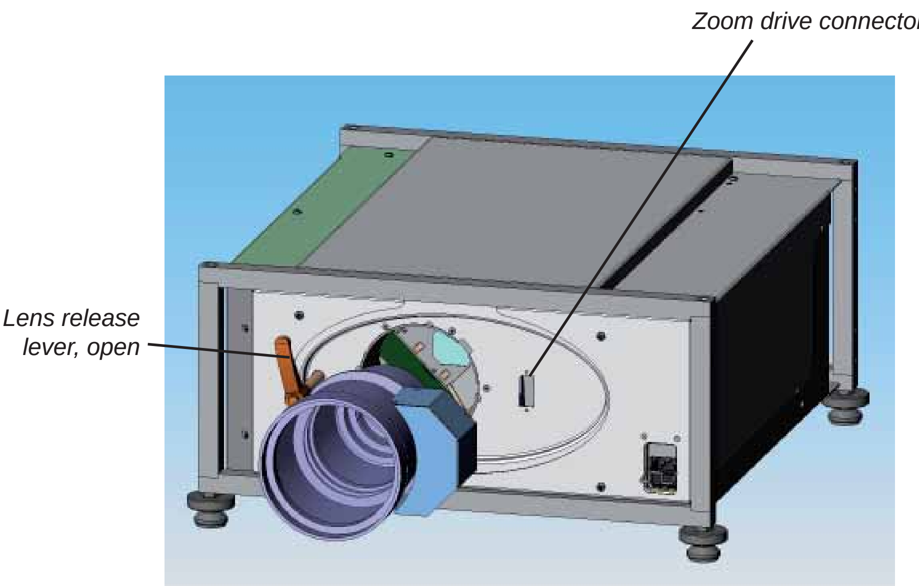
The Throw ratio for a particular lens is fixed, but assumes that the image fills the width of the DMD.

For images that do not fill the width of the DMD, the Throw ratio is effectively increased. To correct for this, a Throw Ratio Factor (TRF) is used.

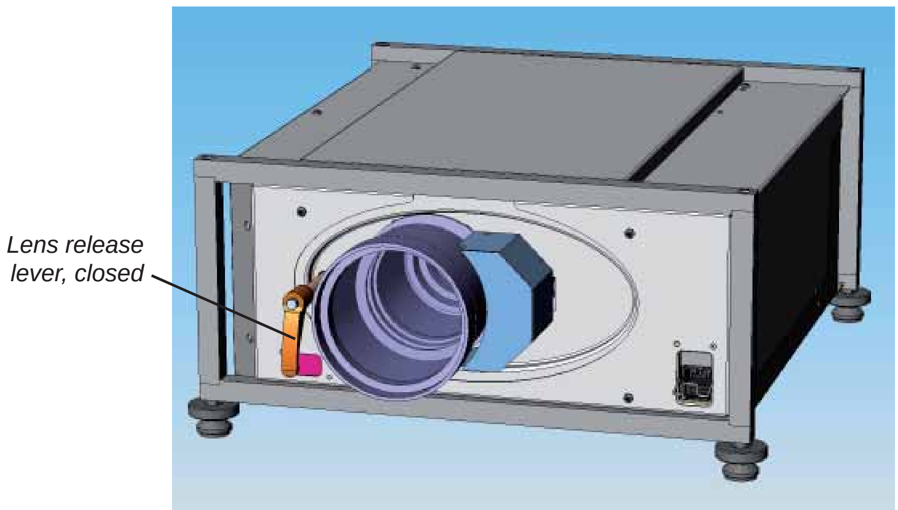
Lens extension is measured when the lens is focused at infinity, and fully extended. At other focus settings, the extension could be up to 10mm less

Fitting the lens

- Turn the lens release lever anti-clockwise so that it is pointing upwards, to open the lock.
- Remove the rear lens cap from the lens.
- Insert the lens into the lens aperture, making sure that the plug on the drive mechanism engages with the socket on the front of the projector, and that the lens is pushed firmly into place.



- Turn the lens release lever clockwise to lock the lens in place. When the lock is fully closed, the lever should feel loose.



Notes

Make sure the rear lens cap is removed, before fitting the lens.

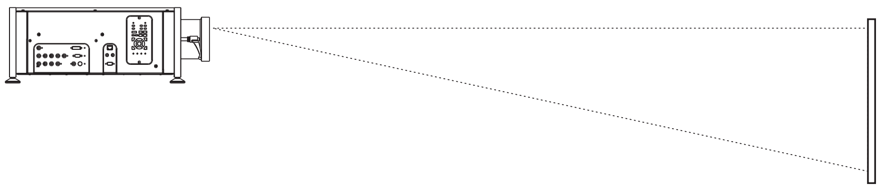
Make sure the front lens cap is removed, before switching on the projector.

Be careful not to scratch the lens surfaces. If you do accidentally touch a lens, then clean the surface using a lens paper.

The lens release lever should always be set to the locked position to prevent the lens from falling out.

Shifting the image

The normal position for the projector is at the centre of the screen. However, you can set the projector above or below the centre, or to one side, and adjust the image using the **Lens shift** feature to maintain a geometrically correct image.



- Any single adjustment outside the ranges specified below may result in an unacceptable level of distortion, paricularly at the corners of the image, due to the image passing through the periphery of the lens optics.
- If the lens is to be shifted in two directions combined, the maximum range without distortion will be somewhat less, as can be seen in the diagrams to the right.

The maximum range available with no distortion is dependent on which lens is used. The tables below show the maximum range for images that fill the DMD.

Fixed lenses

vertical (pixels)	*horizontal (pixels)*	*vertical (vs DMD height)*	*horizontal (vs DMD width)*
no shift possible			

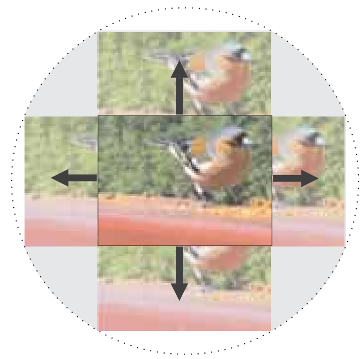
Zoom lenses

vertical (pixels)	*horizontal (pixels)*	*vertical (vs DMD height)*	*horizontal (vs DMD width)*
702 up 351 down	288 left 288 right	0.65H up 0.33H down	0.15W left 0.15W right

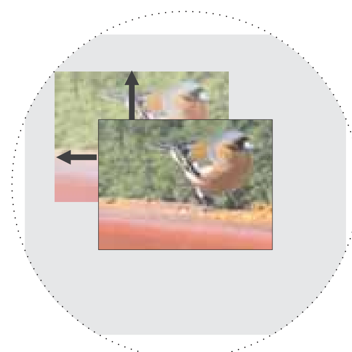
Notes

For more information on using the Lens shift feature, see ***section 4. Using the menus, Lens menu****.*

If the lens is to be shifted in two directions combined, the maximum range is somewhat less, as can be seen below. (zoom lens shift shown).



full horizontal and vertical shift without distortion



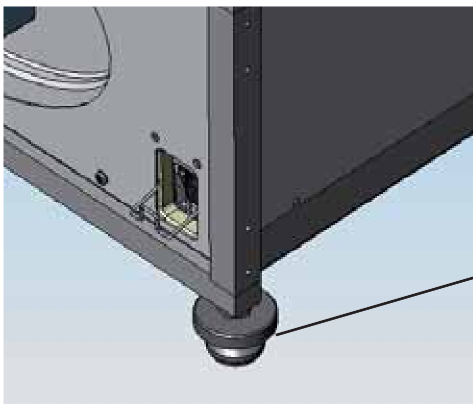
combined shift without distortion is reduced

Mounting the projector

The projector is designed to be used on a flat surface, but the optional rigging frame will allow it to be suspended from a lighting truss or rigging. The four adjustable feet under the chassis allow the projector to be lowered onto a flat surface without any danger of hands being trapped between the bottom frame and the surface.

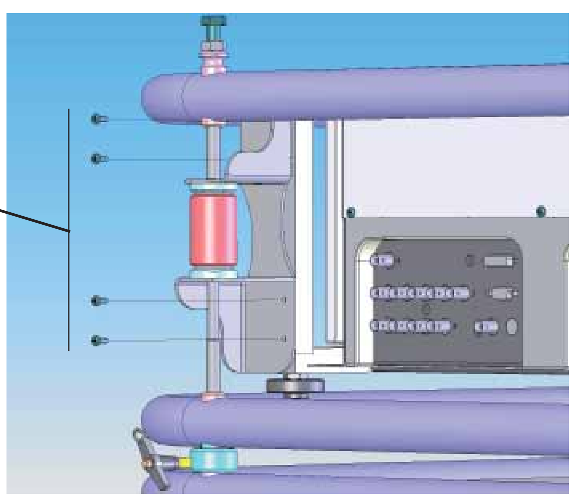
Chassis adjustment

If the projector is to be operated from a flat surface such as a projector table, then adjustment of projector level should be made by turning the four feet under the chassis.



Fitting the optional rigging frame

- The rigging frame should be secured to the projector using the twelve screws supplied, as shown in the pictures below. Four screws secure each of the threee adjuster brackets to its corner post. Fit the screws to the round holes first, then fit the screws to the oval holes.



- Before suspending the projector, make sure that all the frame adjusters are set roughly midway.

Notes

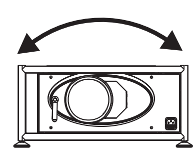
BEFORE INSTALLING THE PROJECTOR, READ ALL THE WARNINGS BELOW AND ALL THOSE IN *IMPORTANT INFORMATION* AT THE FRONT OF THIS MANUAL.

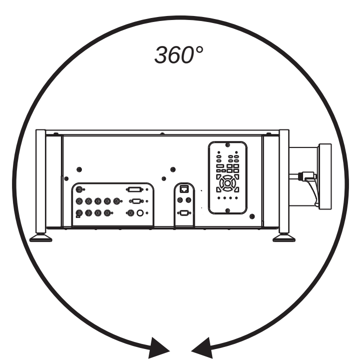
The projector weighs approximately 27kg (60lb). Use safe handling techniques when lifting the projector.

Make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of the projector and lens (see specification for weights)**.**

Backup safety chains or wires should always be used.

Do not tilt the projector more than ±12° from side to side when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement. The projector my be tilted forwards and backwards as necessary.

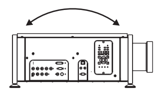




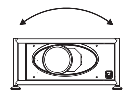
Adjusting the rigging frame

Coarse adjustment of projector level should be made by adjusting the length of the supporting wires or chains, or by adjusting the position of the truss or rigging. Once the initial coarse adjustment has been made, fine adjustment can be made by turning the frame adjusters on the rigging frame:

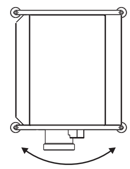
- The single vertical adjuster at the front left corner is used to raise or lower the front of the projector (pitch adjustment).

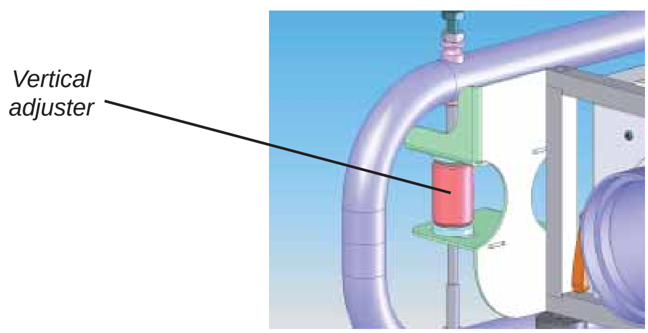


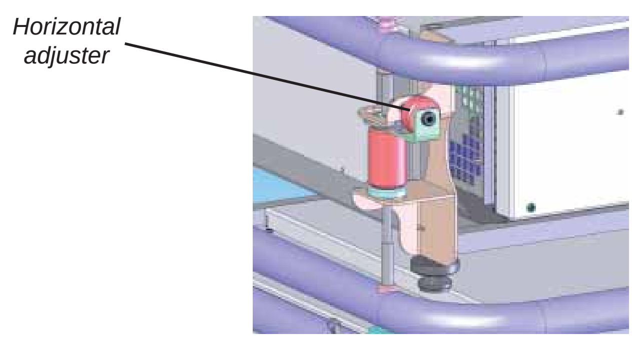
- The two vertical adjusters at the rear are used to rotate the projector around the lens axis (roll adjustment).



- The horizontal adjuster at the rear right corner (viewed from the front) is used to rotate the projector around its vertical axis (yaw adjustment).







Notes

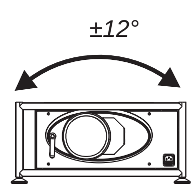
BEFORE INSTALLING THE PROJECTOR, READ ALL THE WARNINGS BELOW AND ALL THOSE IN *IMPORTANT INFORMATION* AT THE FRONT OF THIS MANUAL.

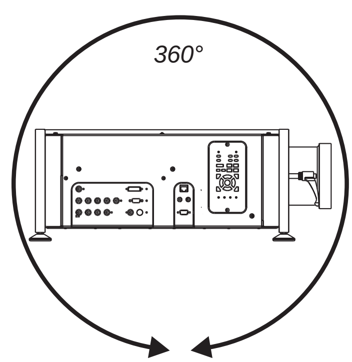
The projector weighs approximately 27 kg (50 lbs). Use safe handling techniques when lifting the projector.

Make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of the projector and lens (see specification for weights)**.**

Backup safety chains or wires should always be used.

Do not tilt the projector more than ±12° from side to side when in use, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement. The projector my be tilted forwards and backwards as necessary.



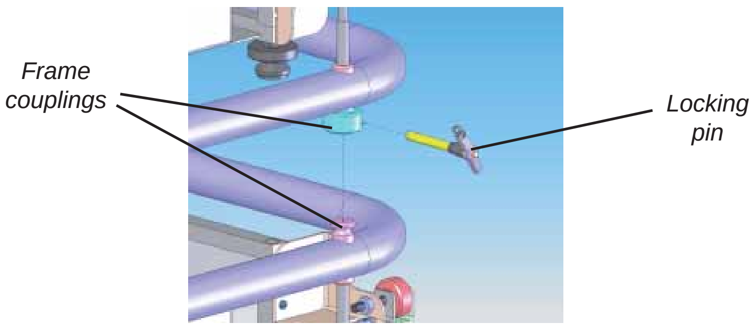


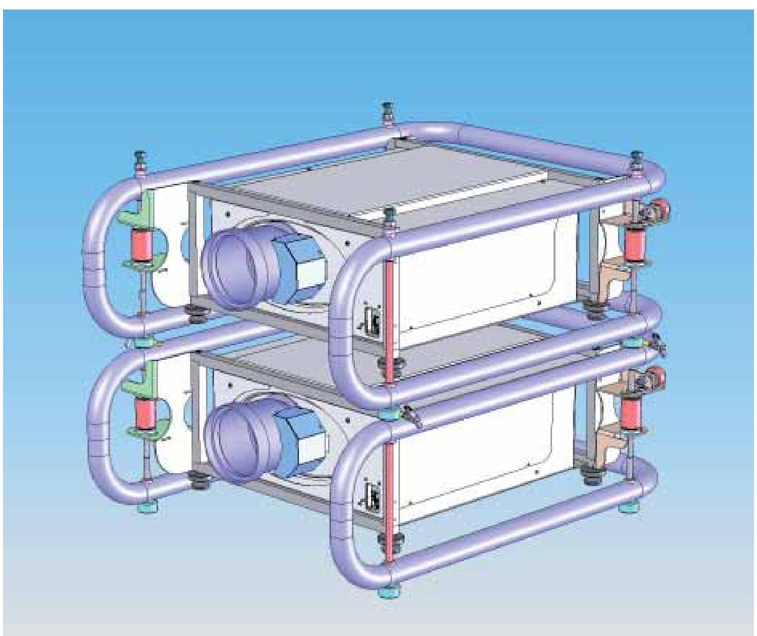
Stacking projectors

The rigging frame is capable of supporting the weight of up to two other projectors, using the built-in frame couplings. The projectors can be stacked on top of each other, or suspended below each other.

- Carefully lower each projector down onto the top of the others, making sure that all four frame couplings engage fully.

- Fit a locking pin into each coupling. A ball in the end of the pin prevents the pin from falling out – to insert or remove a locking pin, press the button on the t-bar to release the ball.





- Align the images from the projectors, following the instructions in **section 3. Getting started**, **Adjusting the lens** and **Adjusting the projected image**.

Notes

When stacking projectors, the stack MUST be vertical, to ensure that the stresses are distributed to all frame couplings.

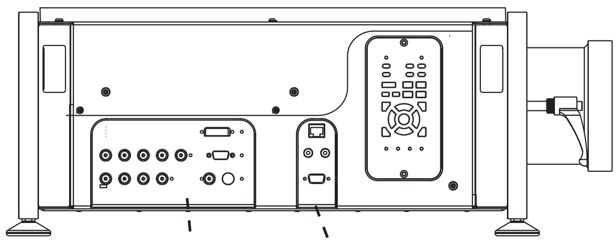
Make sure that the surface, ceiling or rigging that is to support the projector is capable of supporting the combined weight of all the projectors and lenses (see specification for weights)**.**

Do not place heavy objects on top of the projector chassis. Only the chassis corners and the rigging frame are capable of withstanding the weight of another projector.

Do not try to stack more than 3 projectors.

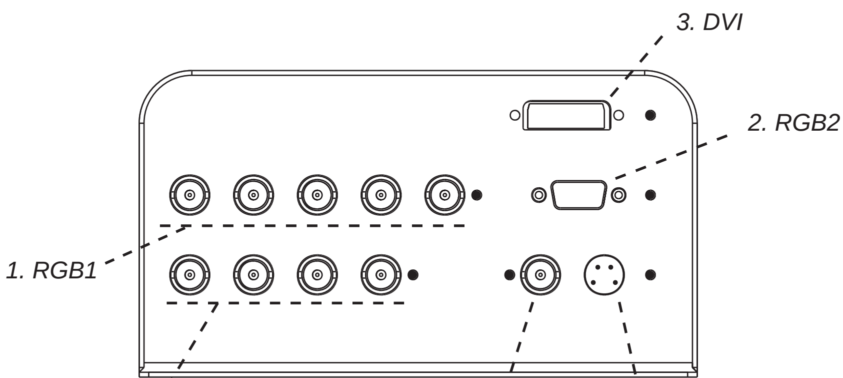
Separate backup safety chains or wires should always be used for each projector.

Connecting the projector



Signal Inputs

The following inputs are available:



EDID handshaking on the DVI and RGB2 inputs

If you are using a computer DVI card or other source that obeys the EDID handshaking protocol, then the card or source will automatically configure itself to suit the projector.

If not, then you should refer to the documentation supplied with the source to manually set the resolution to 1920 x 1080 or the nearest suitable setting. Switch off the source, connect to the projector, then switch the source back on again.

Notes

For more information on selecting an input source, see **section 4. Overview, Using the control keys***, and* **Using the menus***.*

Input 4. is not used on this projector.

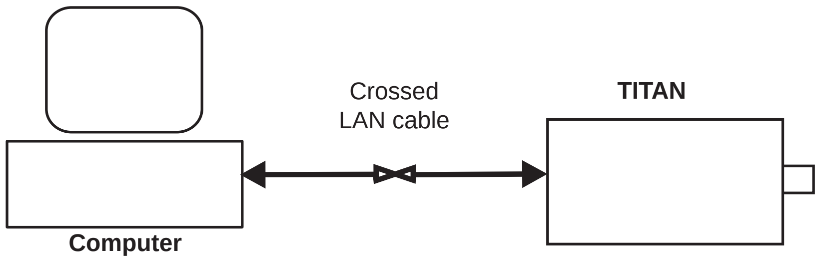
For more information about pin connections and control codes see **section 7. Appendix.**

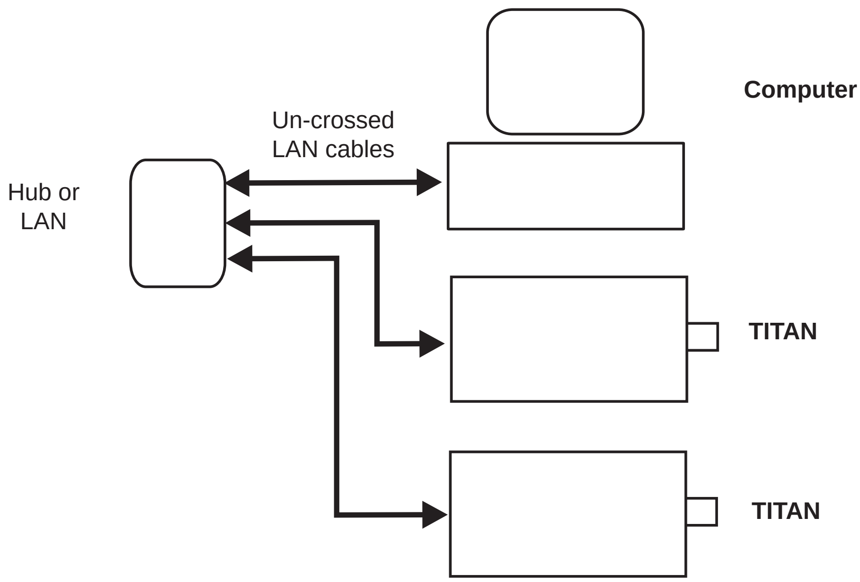
For more information on input modes see **section 4. Overview***.*

Control connection examples

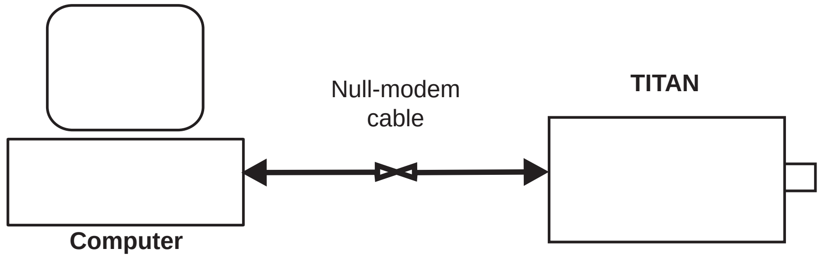
LAN connection

All of the projector's features can be controlled via a LAN connection, using a standard internet browser package such as Internet Explorer.





RS232 connection



Notes

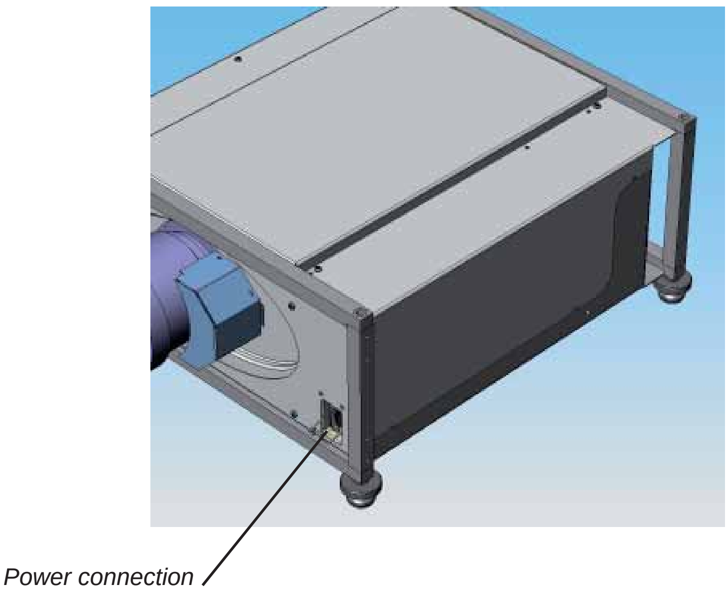
☞ *For more information about pin connections and control codes see* **section 7. Appendix.**

☞ *For more information about using a browser to control the projector see* **section 4. Using the menus***.*

Power connection

When mains power is first applied, the projector will perform a self-test, then go into Standby mode.

The Power indicator on the control panel will show amber until the **POWER** (ON) on the remote control or the keypad, is pressed for 3 seconds.



Notes

Use only the power cable provided.

Ensure that the power outlet includes a Ground connection, as this equipment MUST be earthed.

Handle the power cable carefully and avoid sharp bends. Do not use a damaged power cable.

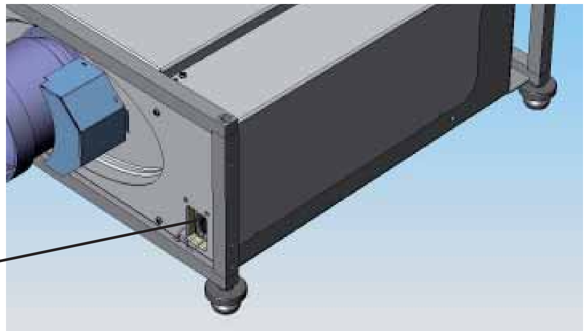
3. Getting Started

Contents

Switching the projector on *3.2*
Selecting an input or test pattern *3.2*
Input *3.2*
Test pattern *3.2*
Adjusting the lens *3.3*
Focus *3.3*
Zoom *3.3*
Shift *3.3*
Adjusting the projected image *3.4*
Picture settings *3.4*
Geometry settings *3.4*
Switching the projector off *3.4*

Switching the projector on

- Connect the power cable between the mains supply and the projector.



Wait until the self-test has completed and the power indicator on the control panel shows amber. The lamp will be off, the shutter closed, and the projector will be in STANDBY mode.

- Press POWER ON on the remote control or the keypad, and hold for about 3 seconds to switch the projector ON. The power indicator on the control panel will show green, the lamp will light and the shutter will open.

Selecting an input or test pattern

Input

- Press INPUT + or − INPUT to change to the next input up or down the following list:

1. RGB1

2. RGB2

3. DVI

4. (not used in this projector)

5. Composite Video

6. S-Video

7. Component

- Or press the numbered keys **1–7** to change directly to the input:

1 RGB1 | 2 RGB2 | 3 DVI

4 SDI | 5 VID | 6 SVID

7 COM

Test pattern

If you have no video source connected to the projector, then you can display a test pattern as follows:

- Press TEST on the remote control, to select a test pattern.

Notes

For more information about connecting the power cable, see **Power Connections***, in* **section 2. Installation***.*

For more detailed information about:

- using the control keys on the remote control or keypad,

- using the menus,

see the next section: ***Controlling the projector****.*

Input 4. is not used on this projector.

Adjusting the lens

Focus

- Press FOCUS followed by ▲ and ▼ to adjust the focus.

  When adjustment is finished, press EXIT.

Zoom

- Press ZOOM followed by ▲ and ▼ to adjust the zoom.

  When adjustment is finished, press EXIT.

Shift

- Press SHIFT followed by ▲, ▼, ◀ or ▶ to shift the lens up, down, left or right.

  When adjustment is finished, press EXIT.

Notes

☞ *For more detailed information about:*

- using the control keys on the remote control or keypad,

- using the menus,

see the next section: ***Controlling the projector****.*

☞ *When any of the three Lens adjustment keys is pressed, the blue Transmit indicator on the remote control will light for 10 seconds:*

- after 10 seconds, if no adjustment has been made, the indicator will go out and the Lens adjustment key must be pressed again to resume adjustment.

- to end the adjustment before 10 seconds has elapsed, press the EXIT *key.*

- all other adjustments will be locked out until the Lens adjustment is ended.

Adjusting the projected image

Picture settings

- Press a ◯ key, followed by ◀ and ▶ to adjust these picture settings:

Brightness	◯ BRI
Contrast	◯ CON
Saturation	◯ SAT
Phase	◯ PHASE
Aspect ratio	◯ ASPECT

Geometry settings

- Press Keystone ◯ KEYST

  followed by ◀ and ▶ to adjust the keystone correction.

- Press Position ◯ POS *(for all inputs except DVI)*

  followed by ◀, ▶, ▲ and ▼ to adjust the picture position, for images smaller than the DMD.

Switching the projector off

- Press POWER OFF on the remote control or keypad, and hold for 3 seconds, to switch the projector OFF.

Notes

The **Saturation** *control is available for Composite, S-Video and Component inputs only.*

The **Phase** *control is available for RGB inputs only.*

For more detailed information about:

- using the control keys on the remote control or keypad,

- using the menus,

see the next section: ***Controlling the projector****.*

For all adjustments that require more than one key to be pressed:

- after 10 seconds, if no adjustment has been made, the indicator will go out and the adjustment key must be pressed again.

- to end the adjustment before 10 seconds has elapsed, press a different adjustment key, or press the Exit key.

Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp

4. Controlling the projector

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Overview

Controlling the projector

The projector can be controlled from:

- the remote control
- the keypad
- the RS232 input
- the Ethernet input

For more information about controlling the projector using the RS232 and Ethernet inputs, see **Remote communications protocol** in **section 7. Appendix.**

For information about how to connect the projector, see **Connecting the projector** in **section 2. Installation**, and **Connections in section 7. Appendix**.

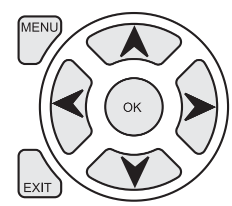
- Many features are controlled from the menus using the menu navigation keys on the remote control or keypad.

For more information about using the menus, see later in this section, **Using the menus**.

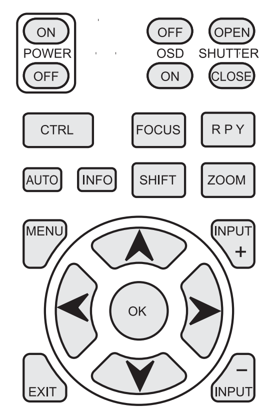
- Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the control keys at the bottom of the remote control.
- Other features, eg zoom and focus, are controlled using the control keys at the top of the remote control and keypad.

For more information about using the control keys, see later in this section, **Using the control keys**.

Notes



Menu navigation keys



Control keys

Input modes and settings

Input mode detection

The projector can automatically detect the following parameters from the incoming video signal:

- line frequency
- frame rate
- interlace / progressive

From these parameters the projector can determine input mode, for example:

input source	horizontal	vertical	mode
composite	15.73KHz	60.0Hz	= NTSC
RGB1	31.51KHz	60.0Hz	= SDTV 480p
DVI	64.02KHz	60.0Hz	= SXGA 60

When you select a new input source, the green LED near the input connector will flash, and the searching message will be displayed.

Searching

When the input mode has been detected, the LED will show continuously and the auto detect message will be displayed, for example:

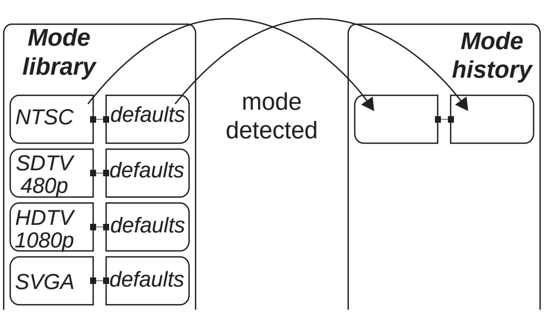
RGB1
Auto Detect

If the input mode cannot be detected, the LED will continue to flash, to show that the input is still selected. However, the following message will be displayed:

Out of Range

Mode library and mode history

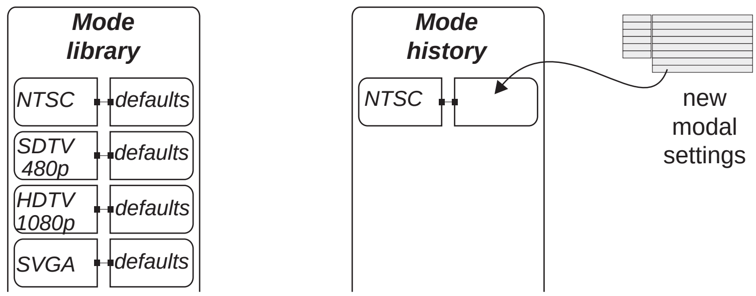
Once an input mode has been successfully determined for the first time, a set of default modal settings (picture, geometry and colour), will be copied from the **mode library** to the **mode history**.



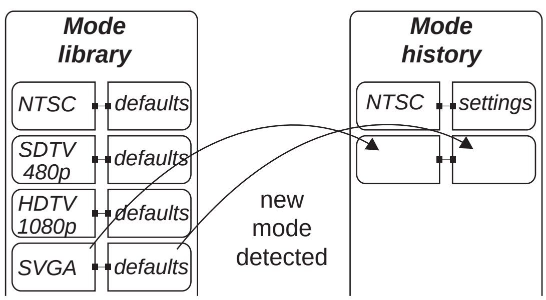
Notes

For a full list of supported input modes, see **Input modes supported***, in* **section 7. Appendix***.*

Any subsequent changes that you make to the modal settings will be saved in the mode history, with the input mode.



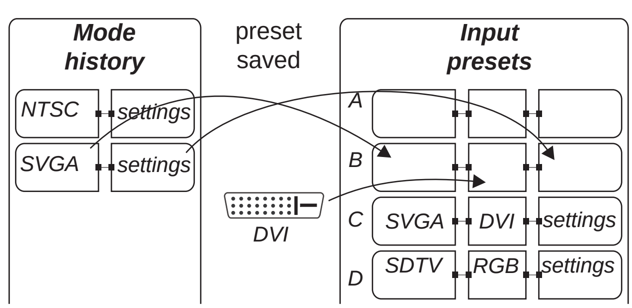
If a new signal is detected, the mode history for the previous signal will be saved in the mode history, and the new mode added, along with a new set of default settings. Thus the projector builds up a history of input modes, and the required settings for each mode, depending on actual useage.



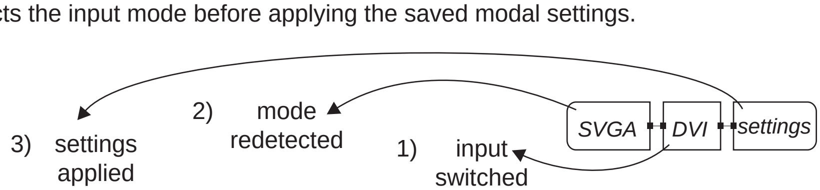
Input presets

It may be the case that you need to save more than one set of modal settings for the same input mode. For example you may have more than one video player or a selection of films with different characteristics.

In that case, the current input source and modal settings can be saved to any one of 16 **input presets**, for recall when the same input source is used again.



When you recell a preset, the projector switches to the saved input source, and redetects the input mode before applying the saved modal settings.



Notes

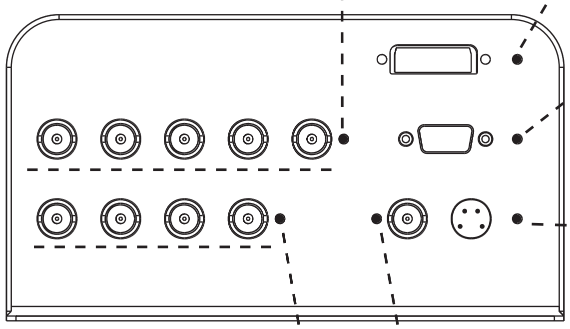
In normal use, there should be adequate memory to record all likely modal settings in the mode history.

However, in exceptional circumstances, the least used settings will be deleted, to allow a new mode to be added.

A preset can be applied only to the same mode for which it was created. If the detected input mode does not match, then settings from the mode history or mode library will be applied.

Indicators

Input status indicators



The indicator next to each input connector on the input panel will light as follows:

off = input not selected

green = input selected, signal detected and in range

flashing green = input selected, but signal **not** detected or out of range

Notes

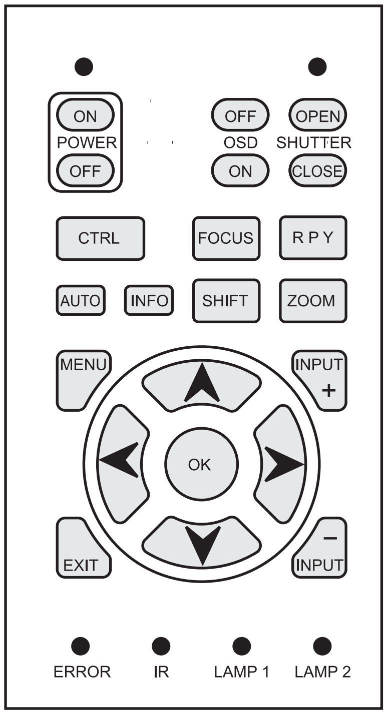
There are more indicators on the Control panel, and these are described on the next page.

Input 4. is not used on this projector.

The control panel

Keypad layout

The controls on the keypad are identical to those at the top of the remote control, and are described on the following pages.



Projector status indicators

The indicators on the control panel are as follows:

Power *off* = NO POWER

green = normal RUNNING mode *amber* = STANDBY mode

Shutter *yellow* = CLOSED *green* = OPEN

Error *off* = NO ERROR

flashing = ERROR (temperature) *steady* = ERROR (voltage)

IR *blue flash* = Remote control command received

Lamp 1 *off* = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green/amber = LAMP COOL-DOWN or WARM-UP

Lamp 2 *off* = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green/amber = LAMP COOL-DOWN or WARM-UP

Notes

Many features are controlled from the menus using the **menu navigation keys** *on the remote control or keypad.*

For more information about using the menus, see later in this section, **Using the menus**.

Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the ***control keys*** *at the bottom of the remote control.*

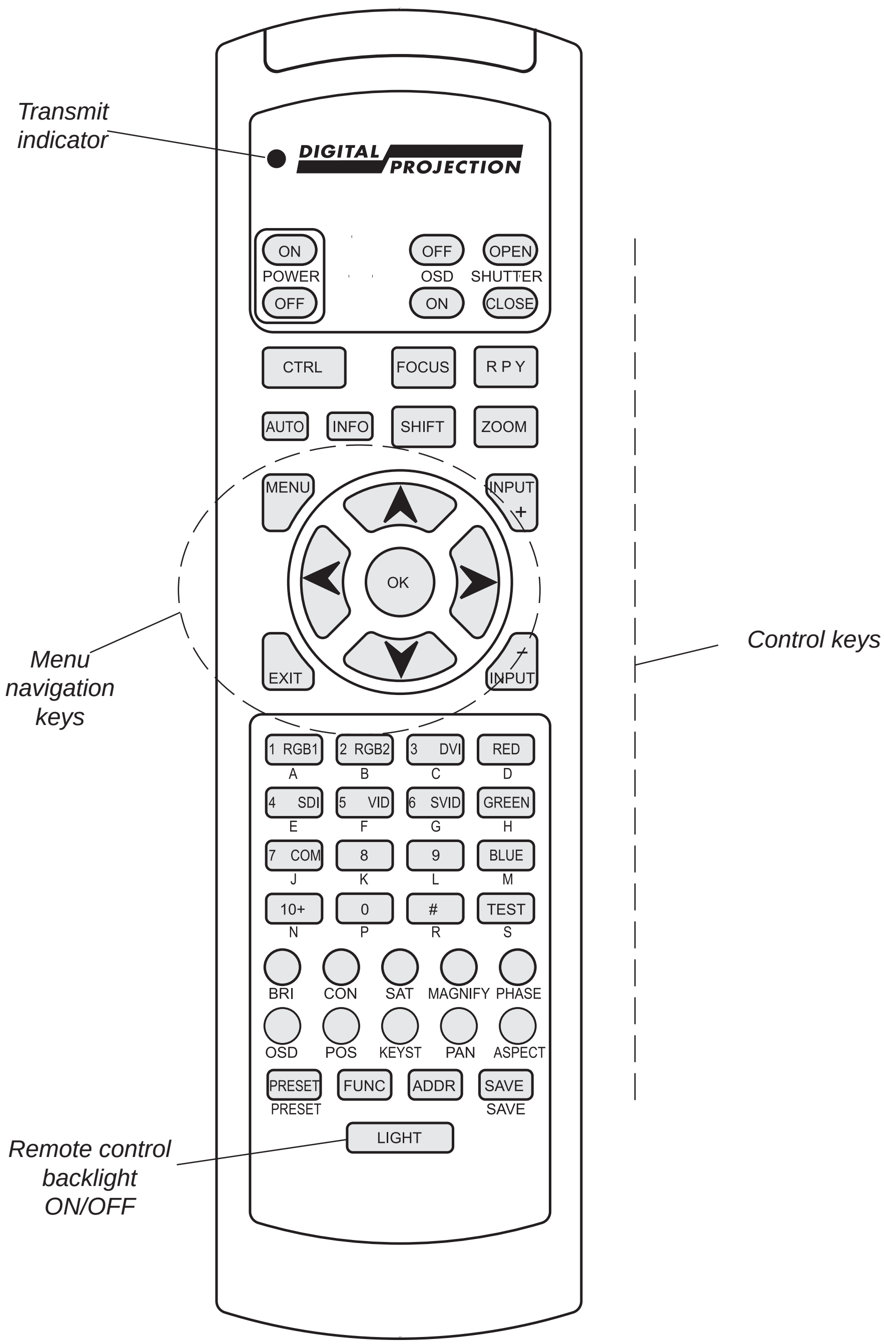
Other features, eg zoom and focus, are controlled using the **control keys** *at the top of the remote control and keypad.*

For more information about using the control keys, see later in this section, **Using the control keys**.

The **Lamp 2** *indicator applies only to the 1080p-500. The 1080p-250 has only one lamp.*

The remote control

Layout



Timeout

There is a 10 second timeout for the three Lens adjustment keys (see note on next page).

There is a separate, adjustable timeout for the On Screen Menus (see **On Screen Display**, in **Setup Menu**, later in this section).

Notes

Many features are controlled from the menus using the ***menu navigation keys*** *on the remote control or keypad.*

For more information about using the menus, see later in this section, **Using the menus**.

Some of the menu features, for example brightness, contrast and input preset operations, can be accessed directly using the ***control keys*** *at the bottom of the remote control.*

Other features, eg zoom and focus, are controlled using the **control keys** *at the top of the remote control and keypad.*

For more information about using the control keys, see later in this section, **Using the control keys**.

The following keys are **NOT** *used on this projector:*

CTRL
R P Y
FUNC
10+ *(but N is used)*
*(but R is used)*

Note that plugging in the remote control cable will disable the infra-red.

Using the control keys

Power

- Press POWER ON and hold for 3 seconds, to switch the projector ON.
- Press POWER OFF and hold for 3 seconds, to switch the projector OFF.

Shutter

- Press SHUTTER OPEN to OPEN the shutter.
- Press SHUTTER CLOSE to CLOSE the shutter.

On-Screen-Display

- Press OSD OFF to switch the On-Screen-Display OFF.

  This includes ALL menus, controls and on-screen messages.
- Press OSD ON to switch the On-Screen-Display ON.

Focus

- Press FOCUS followed by ⋀ and ⋁ to adjust the focus.

  When adjustment is finished, press EXIT.

Zoom

- Press ZOOM followed by ⋀ and ⋁ to adjust the zoom.

  When adjustment is finished, press EXIT.

Shift

- Press SHIFT followed by ⋀, ⋁, < or > to shift the lens up, down, left or right.

  When adjustment is finished, press EXIT.

Notes

☞ *Closing the shutter produces a better black than simply removing the signal, as the light source will be completely blocked by the shutter blade.*

☞ *When the OSD is OFF:*

- all menu navigation keys are disabled.

- keys such as ◯ ***BRI (****brightness) will still function, but the slider bars will not be visible on screen.*

☞ *When any of the three Lens adjustment keys is pressed, the blue Transmit indicator on the remote control will light for 10 seconds:*

- after 10 seconds, if no adjustment has been made, the indicator will go out and the Lens adjustment key must be pressed again to resume adjustment.

- to end the adjustment before 10 seconds has elapsed, press the EXIT *key.*

- all other adjustments will be locked out until the Lens adjustment is ended.

☞ *For more information about the amount of lens shift available, see* **section 2. Installation***.*

Auto-detect input mode

- Press AUTO to force the projector to re-detect the input mode (see **Input modes and settings**, earlier in this section).

Source information

- Press INFO to display the source information screen.

Input

- Press INPUT + or – INPUT to change to the next input up or down the following list:

  1. RGB1

  2. RGB2

  3. DVI

  4. (not used in this projector)

  5. Composite Video

  6. S-Video

  7. Component

- Or press the numbered keys 1–7 to change directly to the input:

  1 RGB1 2 RGB2 3 DVI

  4 SDI 5 VID 6 SVID

  7 COM

Notes

For more information about input mode detection, see earlier in this section, ***Input modes and settings****.*

Input 4. is not used on this projector.

Input Presets

Recall

- To recall a set of modal settings that have been saved, press and hold PRESET, whilst pressing the lettered key A – S.
- The projector will switch to the saved input source, and redetect the input mode before applying the saved modal settings.

Save

- To save the current input source, mode and modal settings, press and hold SAVE, whilst pressing the lettered key A – S.

  If this Preset has been used before, and the Input source has been changed, then the following message will be displayed.

Overwrite Preset?
OK Cancel

- Press ◀ and ▶ to select either OK or Cancel.
- Press OK to confirm your selection.
- The modal settings will be saved to the selected preset, and the following message will be displayed.

Preset Saved

Notes

For more information about input modes and input presets, see earlier in this section, **Input modes and settings***.*

A preset can be applied only to the same mode for which it was created. If the detected input mode does not match, then settings from the mode history or mode library will be applied.

For more information about input modes, see **Input modes and settings***. earlier in this section.*

Red, Green and Blue

- Press RED, GREEN or BLUE to switch the red, green or blue components OFF or ON.

Test pattern

- Press TEST to select a test pattern.

Picture settings

- Press a key, followed by < and > to adjust these picture settings:

Brightness	**BRI**
Contrast	**CON**
Saturation	**SAT**
Phase	**PHASE**
Aspect ratio	**ASPECT**

Geometry settings

Keystone adjustment is used to correct for distortion caused by the projector being mounted higher or lower than the screen.

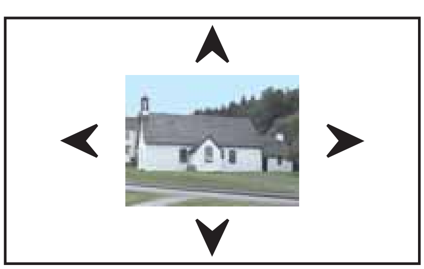
- Press Keystone KEYST,

  followed by < and > to adjust the keystone correction:



- Press Position POS,

  followed by <, >, ∧ and ∨ to adjust the picture position, for images smaller than the DMD:



Notes

The red, green and blue keys are disabled when the OSD is switched OFF.

The **Saturation** *control is available for Composite, S-Video and Component inputs only.*

The **Phase** *control is available for RGB inputs only.*

For all adjustments on this page that require more than one key to be pressed:

- after 10 seconds, if no adjustment has been made, the key must be pressed again to resume adjustment.

- to end the adjustment before 10 seconds has elapsed, press a different adjustment key, or press the EXIT *key.*

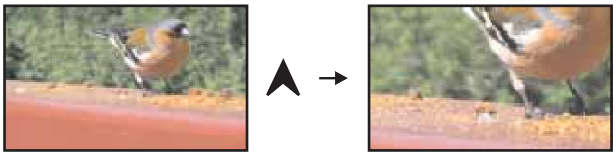
When the OSD is OFF:

- the keys will still function, but the controls will not be visible on screen.

Magnify and pan

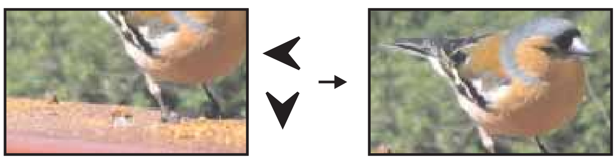
- Press Magnify MAGNIFY

  followed by ▲ and ▼ to adjust the size of the picture.



- Press Pan PAN

  followed by ◄, ►, ▲ and ▼ to adjust the position of the magnified image.



On-screen-display size

- Press Size SIZE

  to switch the size of the OSD between large and small.

Remote control address

The projector and the remote control need to be set to matching addresses. Read the note to the right on this page, and follow the instructions in the order shown below:

1 Set the projector address as shown in **Setup menu**, later in this section.

2 Set the remote control address:

- Press and hold ADDR

  whilst pressing two numbered keys 0 – 9

  to set the remote control address to any number between 00 and 99.
  (leading zeros must be used for numbers less than 10)

Remote control backlight

- Press LIGHT to switch the backlight on and off.

Notes

The magnify feature utilises a digital zoom. Used with the pan control, this can be used to:

- enlarge a section of the image

- enable the use of multiple projectors to construct a large image from tiles.

The pan control is available only when the image has been magnified.

If the OSD moves off screen due to a change in image size, then pressing the size key will restore its readability.

When fresh batteries are inserted in the remote control it will default to address **00**. *Remote control* **00** *is a* **master** *control, able to control all projectors.*

If two or more projectors are set to the same address, they can be controlled from one remote control, provided they are connected by cable or in range of the infra red.

Using the menus

Navigating menus and submenus

When the menus are in use and the OSD is ON, the **top level menu headings** are always visible to the left of the screen.

Input	
Picture	
Geometry	
Colour	
Setup	
Information	

Each **menu** item can lead to a number of **submenus**, which are displayed in the column to the right . The ▶ symbol indicates that a submenu is available.

Each **submenu** can lead to further submenus, up to a maximum of three levels.

- To display the menus, press MENU on the remote control or the keypad.
- The menus will always open at the same point they were last viewed. The example below shows the first menu display following power on – the item that is currently selected (the Input menu) is highlighted in blue.

Input	1. RGB1
Picture	2. RGB2
Geometry	3. DVI
Colour	5. Composite Video ⇦
Setup	6. S-Video
Information	7. Component
	Presets ▶

- To select a menu, press ⋀ and ⋁, for example the Setup menu:

Input	Projector ▶
Picture	Global Colour Settings ▶
Geometry	Lamp ▶
Colour	On Screen Display ▶
Setup	Password ▶
Information	Communication ▶
	Restore Defaults ▶

Notes

Some menu controls can be accessed directly using the ***control keys*** *(see earlier in this section).*

When the OSD is OFF, all menu navigation keys will be disabled.

When the OSD is switched back ON, the menus will remain OFF until the MENU key is pressed again. The menus will then reopen at the same point they were last viewed.

If a menu is opened, and no other key is pressed within the period set in the ***OSD Timeout*** *menu, then the menus will disappear. When the MENU key is pressed again, the menus will reopen at the same point they were last viewed.*

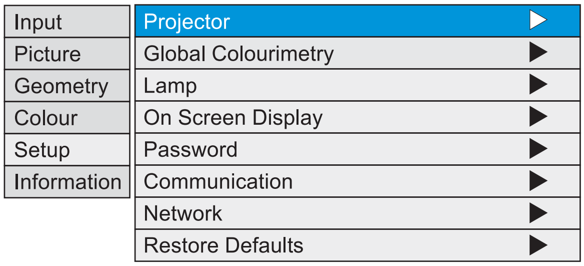
(see ***On Screen Display****, in* ***Setup Menu****, later in this section).)*

Main menu: Input

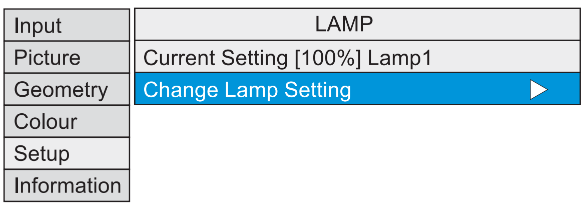
Input 4. is not used on this projector.

Main menu: Setup

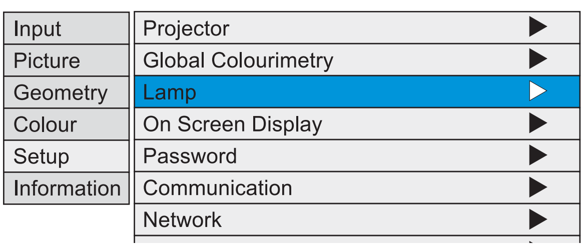
- Press ➤ to open the menu. The blue highlight moves to the first item in the menu, which may be submenu, for example the Projector Setup submenu.



- To select a submenu, press ⮝ and ⮟, for example the Lamp submenu. Press ➤ to open the submenu. The submenu opens, with the title at the top.



- To close the submenu and return to the previous level, press EXIT.



- There may be up to three levels of submenu, so to return to the top level, you may have to press EXIT up to three times.

- To close the menu display completely, press MENU.

Notes

Setup menu

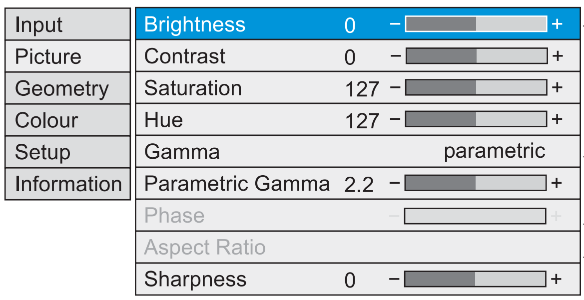
Setup menu
Lamp

Setup menu

Menu controls

Some menus have controls, as shown in the examples below.

> ***Notes***
>
> *Some menus items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.*



Slider bar

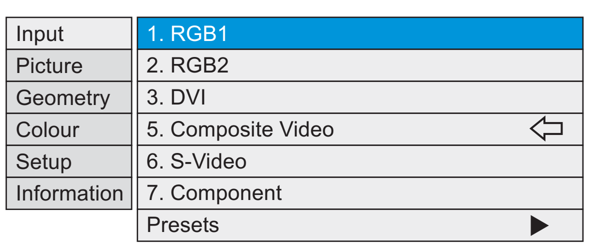
The highlighted slider bar shows which control is active currently.

To adjust the slider press ❮ *and* ❯.

Parameter selection

To select from a number of parameters, (shown one at a time to the right), press ❮ *and* ❯.

These two items are greyed out and the values are blank, showing that they are not available, due to the effect of settings made in other menus, or due to the type of input signal.



Parameter list

To select from a list of parameters, press ▲ *and* ▼.

Input menu

*To return to the **main menu**, press* EXIT *up to three times.*

From the main menu:

- Press ▲ and ▼ until Input is highlighted.

  Press ➤ to open the Input menu. The blue highlight moves to the first item in the menu. The ⇦ symbol shows which input is currently selected.

Input	1. RGB1
Picture	2. RGB2
Geometry	3. DVI
Colour	5. Composite Video ⇦
Setup	6. S-Video
Information	7. Component
	Presets ▶

Input Source

- Press ▲ and ▼ to select from:

  1. RGB1

  2. RGB2

  3. DVI

  4. (not used in this projector)

  5. Composite Video

  6. S-Video

  7. Component

- Press OK to confirm your selection.

Notes

*Some menu controls can be accessed directly using the **control keys** (see earlier in this section).*

*When using the menus, press **OSD*** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Input Menu

Input 4. is not used on this projector.

*For more information about the input connections, see **section 2. Installation**, and **section 7. Appendix**.*

When an input has been selected, the projector will automatically detect input mode settings such as line rate and resolution etc.

To force the projector to re-detect the input mode settings, press AUTO.

Input menu continued

Presets

Sixteen sets of parameters can be saved and recalled *(A – S)*. The parameters saved for each **Preset** are:

all settings from the Picture menu,

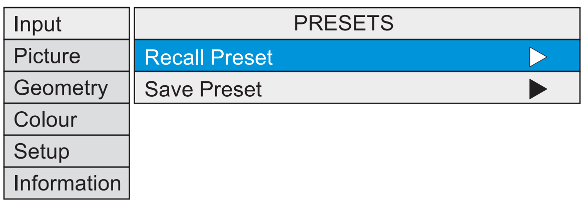
all settings from the Input menu (**1 – 7**)

all settings from the Geometry menu, except Keystone

all settings from the Colour menu, except Global

- Press and to select Presets.

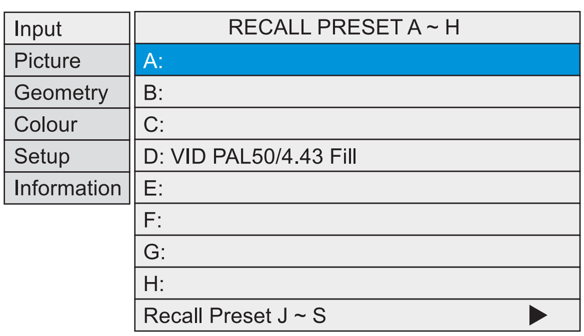
  Press to open the Presets submenu.



Recall Presets

- Press and to select Recall Preset.

  Press to open the Recal Presets A ~ H submenu. Any presets that have been saved are indicated by their description, for example D: in this example.



- To recall a set of parameters that has been saved, press and to select one of the Presets.

  For Presets J to S, select Recall Preset J ~ S then press to open the J~S submenu. Press and to select the Preset.

- Press OK to confirm your selection.

  The Preset parameters will be loaded.

Notes

Some menu controls can be accessed directly using the ***control keys*** *(see earlier in this section).*

For more information about input modes and input presets, see earlier in this section, ***Input modes and settings****.*

Input Menu
Presets

Input Menu
Presets
Recall Presets A ~ H

Input menu continued

Save Presets

- Press ⮝ and ⮟ to select Save Preset.

  Press ➤ to open the Save Presets A ~ H submenu.

Input	SAVE PRESET A ~ H
Picture	Save Preset A
Geometry	Save Preset B
Colour	Save Preset C
Setup	Save Preset D
Information	Save Preset E
	Save Preset F
	Save Preset G
	Save Preset H
	Save Preset J ~ S ▶

- To save the current set of parameters, press ⮝ and ⮟ to select one of the Presets.

  For Presets J to S, select Save Preset J ~ S then press ➤ to open the J~S submenu. Press ⮝ and ⮟ to select the Preset.

  Press (OK) to confirm your selection.

  If this Preset has been used before, but only if the Input source has been changed, then the following message will be displayed.

Overwrite Preset?	
OK	Cancel

  Press ⮜ and ➤ to select either OK or Cancel.

  Press (OK) to confirm your selection.

  The parameters will be saved to the selected preset, and the following message will be displayed.

Preset Saved

Notes

Some menu controls can be accessed directly using the **control keys** *(see earlier in this section).*

Input Menu
Presets
Save Presets A ~ H

Picture menu

To return to the ***main menu****, press* EXIT *up to three times.*

From the main menu:

- Press ▲ and ▼ until Picture is highlighted.

  Press ► to open the Picture menu. The blue highlight moves to the first item in the menu.

Menu	Item	Value
Input	Brightness	0
Picture	Contrast	0
Geometry	Saturation	127
Colour	Hue	127
Setup	Gamma	parametric
Information	Parametric Gamma	2.2
	Phase	127
	Aspect Ratio	1.85:1 (Flat)
	Sharpness	0

Brightness

- Press ▲ and ▼ to select Brightness.

  Press ◄ and ► to adjust the slider (-128 to +127).

Contrast

- Press ▲ and ▼ to select Contrast.

  Press ◄ and ► to adjust the slider (-128 to +127).

Saturation

Adjusts the saturation at white peak levels.

- Press ▲ and ▼ to select Saturation.

  Press ◄ and ► to adjust the slider (0 to 255).

Hue

Adjusts the color balance from green to blue, using the red level as a reference.

- Press ▲ and ▼ to select Hue.

  Press ◄ and ► to adjust the slider (0 to 255).

Notes

Some menu controls can be accessed directly using the ***control keys*** *(see earlier in this section).*

When using the menus, press **OSD** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Picture Menu

Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.

The **Saturation** *slider is available for Composite, S-Video and Component inputs only.*

The **Hue** *slider is available for NTSC inputs only.*

Picture menu continued

Gamma Correction

Video recordings are often supplied with a gamma adjustment applied. The projector's gamma adjustment can be used to correct for this.

- Press ⋀ and ⋁ to select Gamma.

  Press ＜ and ＞ to select from:

Parametric	Enables the gamma slider
User download	Applies the gamma settings made externally using the DP Userware on a personal computer. (default gamma of 2.2)
Graphics	Enhanced highlights and contrast
NTSC	NTSC colour space, with a gamma of 2.2
PAL	PAL colour space, with a gamma of 2.2
Linear	gamma of 1.0
Punch	Enhanced brightness and increased colour saturation for high ambient environments.

Parametric Gamma

- Press ⋀ and ⋁ to select Parametric Gamma.

  Press ＜ and ＞ to adjust the slider (1.0 to 3.0 in 0.1 steps).

Phase

Phase should be set automatically by the projector, but can be adjusted manually to correct for shimmering or poor quality definition on, for example, fine text.

- Press ⋀ and ⋁ to select Phase.

  Press ＜ and ＞ to adjust the slider (0 to 31).

Notes

☞ *For more information about User gamma settings, see* **section 5. DP Userware***.*

☞ **Parametric Gamma** *adjustment is available only when* **Parametric** *is selected in* **Gamma** *selection, above.*

☞ **Phase** *adjustment can be found in both the* **Picture** *and* **Geometry** *menus, and is available for RGB1 and RGB2 inputs only.*

Picture menu continued

Aspect Ratio

- Press ⋀ and ⋁ to select Aspect Ratio.

  Press < and > to select from:

Fill	*This will best fit the incoming source to fill either the height or width without changing the aspect ratio of the source.*
User Aspect	
1.33:1 (4:3)	
1.78:1 (16:9)	
2.35:1 (Scope)	
1.66:1 (Vista)	
1.85 (Flat)	
Theaterscope	*Use with the TheaterScope Anamorphic System only. The 2.35:1 source image is displayed using the full area of the 16:9 DMD. This is then stretched to 2.35:1 by the lens.*
Native	*The image will be displayed pixel for pixel. The image will be centred, with a black border if smaller than 1920 x 1080 or cropped if larger.*

Sharpness

- Press ⋀ and ⋁ to select Sharpness.

  Press < and > to adjust the slider.

Notes

Aspect Ratio *selection can be found in both the Picture and Geometry menus.*

When **User Aspect** *is selected, the Aspect Ratio settings are taken from the* **User H Aspect** *and* **V Aspect** *settings made in the* **Geometry** *menu.*

The **Sharpness** *slider is available for Composite, S-Video and Component SD inputs only.*

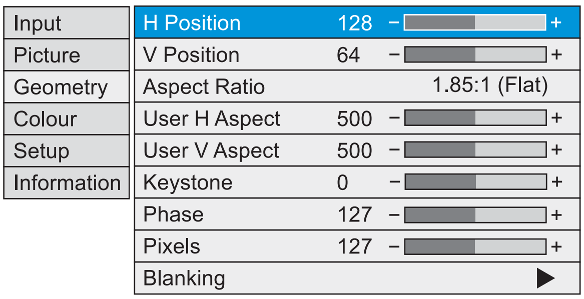
Geometry menu

☞ *To return to the* ***main menu****, press* EXIT *up to three times.*

From the main menu:

- Press ▲ and ▼ until Geometry is highlighted.

  Press ▶ to open the Geometry menu. The blue highlight moves to the first item in the menu.



Horizontal Position

- Press ▲ and ▼ to select H Position.

  Press ◀ and ▶ to adjust the slider.

Vertical Position

- Press ▲ and ▼ to select V Position.

  Press ◀ and ▶ to adjust the slider.

Aspect Ratio

- Press ◀ and ▶ to select from:

Fill *This will best fit the incoming source to fill either the height or width without changing the aspect ratio of the source.*

User Aspect

1.33:1 (4:3)

1.78:1 (16:9)

2.35:1 (Scope)

1.66:1 (Vista)

1.85 (Flat)

Theaterscope *Use with the TheaterScope Anamorphic System only. The 2.35:1 source image is displayed using the full area of the 16:9 DMD. This is then stretched to 2.35:1 by the lens.*

Native *The image will be displayed pixel for pixel. The image will be centred, with a black border if smaller than 1920 x 1080 or cropped if larger.*

Notes

☞ *Some menu controls can be accessed directly using the* ***control keys*** *(see earlier in this section).*

☞ *When using the menus, press* **OSD** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Geometry Menu

☞ *Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.*

☞ **Aspect Ratio** *selection can be found in both the Picture and Geometry menus.*

☞ *When* **User Aspect** *is selected, the Aspect Ratio settings are taken from the* **User H Aspect** *and* **V Aspect** *settings (see next page).*

Geometry menu continued

User Horizontal Aspect Ratio

- Press and to select User H Aspect.

  Press and to adjust the slider (internal number – adjust to fit).

User Vertical Aspect Ratio

- Press and to select User V Aspect.

  Press and to adjust the slider (internal number – adjust to fit).

Notes

☞ **Horizontal and Vertical Aspect Ratio** *adjustments are available only when* **User** *is selected in* **Aspect Ratio**, *(see previous page).*

Keystone

Used to correct for distortion caused by the projector being mounted higher or lower than the screen.

- Press and to select Keystone.

  Press and to adjust the slider (-128 to +127).



☞ **Keystone** *adjustment can be found in both the Geometry and Projector Setup menus.*

Phase

Phase should be set automatically by the projector, but can be adjusted manually to correct for shimmering or poor quality definition on, for example, fine text.

- Press and to select Phase.

  Press and to adjust the slider (0 to 32).

☞ **Phase** *adjustment can be found in both the Picture and Geometry menus, and is available for graphics based RGB sources only.*

Pixels per line

Pixels per line should be set automatically by the projector, but can be adjusted manually to correct for non-standard sources.

- Press and to select Pixels.

  Press and to adjust the slider.

☞ **Pixels** *adjustment is available for graphics based RGB inputs only.*

Geometry menu continued

Blanking

Blanking curtains can be applied to each edge of the picture.

- Press ⋀ and ⋁ to select Blanking.

  Press ➤ to open the Blanking submenu.

Input	BLANKING	
Picture	Blanking	On
Geometry	Left	100 – +
Colour	Right	100 – +
Setup	Top	100 – +
Information	Bottom	100 – +

Blanking On/Off

- Press ≺ and ➤ to select from:

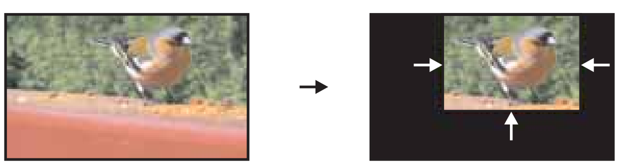
  On

  Off

Blanking adjust

- Press ⋀ and ⋁ to select the edge to be Blanked.

  Press ≺ and ➤ to adjust the slider (0 to 200).



Notes

Geometry Menu
Blanking

The blanking curtains will not applied until **Blanking** *is turned* **On**.

The **On Screen Display** *will move to the centre of the DMD when* **Blanking** *is turned* **On**.

Set to zero for no blanking, eg the top edge in this example.

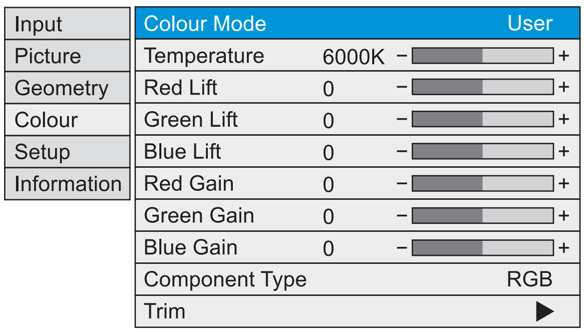
Colour menu

*To return to the **main menu**, press* EXIT *up to three times.*

From the main menu:

- Press ∧ and ∨ until Colour is highlighted.

  Press ➤ to open the Colour menu. The blue highlight moves to the first item in the menu.



Notes on Colour and Global Colourimetry

Global Colourimetry menu *(see later in this section, in **Setup** menu)*

After a calibration check on the projector or venue, a set of Global colour settings can be made in the **Global Colourimetry** menu. These settings are then available to be copied at any time using the **Colour Mode** setting in the **Colour** menu, or used as a starting point using the **Trim** feature in the **Colour** menu.

Colour menu *(see this section).*

The settings made in the **Colour** menu will be automatically saved in the **Mode History**, or can be manually saved to one of the **Input Presets** (see Input modes and settings earlier in this section).

The selections available in **Colour Mode** in the **Colour** menu are:

Global	Copies the settings made in the Global Colourimetry menu
Temperature	Set the colour temperature using the slider
User	Set the Red, Green and Blue Lift and Gain using the sliders
Peak	Preset high brightness setting

Notes

When using the menus, press **OSD** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Colour Menu

Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.

Read these notes on Colour and Global Colourimetry before making any settings in the Colour menus.

Colour menu continued

Colour Mode

- Press ⋀ and ⋁ to select Colour Mode.

  Press < and > to select from:

  Global

  Temperature

  User

  Peak

Colour Temperature

- Press ⋀ and ⋁ to select Temperature.

  Press < and > to adjust the slider (3,000K to 10,000K. in 100 steps).

RGB Lift

- Press ⋀ and ⋁ to select the parameter to be adjusted.

  Press < and > to adjust the slider.

RGB Gain

- Press ⋀ and ⋁ to select the parameter to be adjusted.

  Press < and > to adjust the slider.

Component Type

- Press ⋀ and ⋁ to select Component Type.

  Press < and > to select from:

  RGB

  YPrPb

Notes

Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.

The **Colour Temperature** *slider is available only if* **Temperature** *Mode is selected.*

The **RGB Lift and Gain** *sliders are available only if* **User** *Mode is selected.*

The **Component Type** *selection is available for RGB1, RGB2 and Component inputs only.*

Colour menu continued

Trim

- Press ▲ and ▼ to select Trim.

  Press ► to open the Trim submenu.

Trim RGB Lift and Gain

Menu	TRIM		
Input	Red Lift	0	− +
Picture	Green Lift	0	− +
Geometry	Blue Lift	0	− +
Colour	Red Gain	0	− +
Setup	Green Gain	0	− +
Information	Blue Gain	0	− +
	Global Colourimetry		▶

- Press ▲ and ▼ to select the parameter to be adjusted.

  Press ◄ and ► to adjust the slider (-128 to +127).

Global Colourimetry

- This is a shortcut to the Global Colourimetry submenu, described later in this section, in Setup Menu.

  Press ▲ and ▼ to select Global Colourimetry.

  Press ► to open the Global Colourimetry submenu.

Notes

*The **Trim** submenu is available only if **Global Colour Mode** is selected.*

Colour Menu
Trim

Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.

Setup menu

*To return to the **main menu**, press* EXIT *up to three times.*

From the main menu:

- Press ▲ and ▼ until Setup is highlighted.

  Press ➤ to open the Setup menu. The blue highlight moves to the first item in the menu.

Main menu	Setup menu
Input	Projector ▶
Picture	Global Colourimetry ▶
Geometry	Lamp ▶
Colour	On Screen Display ▶
Setup	Password ▶
Information	Communication ▶
	Network ▶
	Restore Defaults ▶

Notes

When using the menus, press **OSD** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Setup Menu

Setup menu, continued

Projector

- Press ▲ and ▼ to select Projector.

  Press ► to open the Projector submenu.

Orientation

	PROJECTOR	
Input	Orientation	Desktop Front
Picture	Backlight	On
Geometry	Component Video Sync	Sync On Green
Colour	Keystone 0	− +
Setup	Test Pattern	Off
Information		

- Press ▲ and ▼ to select Orientation.

  Press ◄ and ► to select from:

  Desktop Front

  Desktop Rear

  Ceiling Front

  Ceiling Rear

Control Panel Backlight

- Press ▲ and ▼ to select Backlight.

  Press ◄ and ► to select from:

  On

  Off

Component Video Sync

- Press ▲ and ▼ to select Component Video Sync.

  Press ◄ and ► to select from:

  Sync On Green

  Separate

Notes

Setup Menu
Projector

Setup menu, Projector continued

Keystone

Used to correct for distortion caused by the projector being mounted higher or lower than the screen.

- Press ▲ and ▼ to select Keystone.

  Press ◀ and ▶ to adjust the slider (-128 to +127).



Test Pattern

- Press ▲ and ▼ to select Test Pattern.

  Press ▶ to open the Test Pattern submenu.

	TEST PATTERN
Input	
Picture	Off
Geometry	Alignment Grid
Colour	Screen Layout
Setup	Chequerboard
Information	Colourbars
	0% Field
	20% Field
	100% Field
	100% Field (Peak White)

Press ◀ and ▶ to select from:

Off	
Alignment Grid	
Screen Layout	(shows outlines of various aspect ratios)
Chequerboard	
Colour Bars	
0% Field	(black)
20% Field	
100% Field	(white, affected by colour settings)
100% Field (Peak White)	(white, unaffected by colour settings)

Notes

Setup Menu
Test Pattern

Setup menu continued

Global Colourimetry

- Press ⋀ and ⋁ to select Global Colourimetry.
- Press ➤ to open the Global Colourimetry submenu.

Input	GLOBAL COLOURIMETRY		
Picture	Mode		Temperature
Geometry	Temperature	6000K	– +
Colour	Red Lift	0	– +
Setup	Green Lift	0	– +
Information	Blue Lift	0	– +
	Red Gain	0	– +
	Green Gain	0	– +
	Blue Gain	0	– +

Notes on Colour and Global Colourimetry

Global Colourimetry menu *(see this section)*

After a calibration check on the projector or venue, a set of Global colour settings can be made in the **Global Colourimetry** menu. These settings are then available to be copied at any time using the **Colour Mode** setting in the **Colour** menu, or used as a starting point using the **Trim** feature in the **Colour** menu.

Colour menu *(see earlier in this section).*

The settings made in the **Colour** menu will be automatically saved in the **Mode History**, or can be manually saved to one of the **Input Presets** (see Input modes and settings earlier in this section).

The selections available in **Colour Mode** in the **Colour** menu are:

Global	Copies the settings made in the Global Colourimetry menu
Temperature	Set the colour temperature using the slider
User	Set the Red, Green and Blue Lift and Gain using the sliders
Peak	Preset high brightness setting

Notes

Setup Menu
Global Colourimetry

Some menu items may be greyed out - unavailable due to the effect of settings made in other menus, or due to the type of input signal.

Read these notes on Colour and Global Colourimetry before making any settings in the Colour menus.

Setup menu, Global Colourimetry continued

Colour Mode

- Press ▲ and ▼ to select Colour Mode.

  Press ◀ and ▶ to select from:

  Temperature

  User

  Peak

Colour Temperature

- Press ▲ and ▼ to select Temperature.

  Press ◀ and ▶ to adjust the slider (3,000K to 10,000K. in 100 steps).

RGB Lift

- Press ▲ and ▼ to select the parameter to be adjusted.

  Press ◀ and ▶ to adjust the slider.

RGB Gain

- Press ▲ and ▼ to select the parameter to be adjusted.

  Press ◀ and ▶ to adjust the slider.

Notes

⚠ **Read the notes on Colour and Global Colourimetry earlier in this section before making any settings in the Colour menus.**

☞ *The* **Colour Temperature** *slider is available only if* **Temperature** *Mode is selected.*

☞ *The* **RGB Lift and Gain** *sliders are available only if* **User** *Mode is selected.*

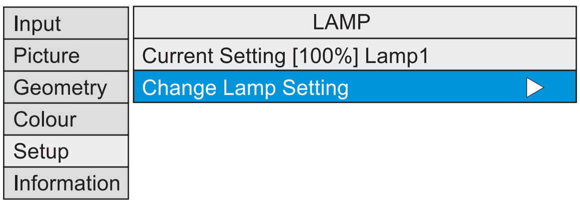
Setup menu, continued

Lamp

- Press ⋀ and ⋁ to select Lamp.

  Press ➤ to open the Lamp submenu.

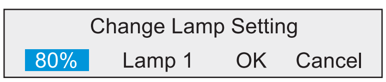
The middle row shows the current lamp setting.



Change Lamp Setting

- Press ⋀ and ⋁ to select Change Lamp Setting.

  Press ➤ to open the Lamp Setting control box.



continued

Notes

Setup Menu
Lamp

Setup menu, Lamp continued

Change Lamp Setting
80% Lamp 1 OK Cancel

Lamp Power

- Press and to select the Lamp Power setting.

  Press and to adjust the Lamp Power from:

  80 to 100% in 1% steps

Lamp Mode

- Press and to select Lamp Mode.

  Press and to select from:

  single lamp modes

  Lamp 1 lamp 1 only

  Lamp 2 lamp 2 only

  Alternate on power up, selects the lamp with the least hours used

  dual lamp mode

  Lamps 1 and 2 both lamps

OK

- Press and to select OK.

  Press OK to apply the new settings.

Cancel

- Press and to select Cancel.

  Press OK or EXIT to exit without applying the new settings.

The indicators on the control panel will show as follows:

Lamp 1 *off* = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green/amber = LAMP COOL-DOWN or WARM-UP

Lamp 2 *off* = OFF

flashing red = LAMP ERROR *green* = ON (100%) *amber* = (80 - 99%)

flashing green/amber = LAMP COOL-DOWN or WARM-UP

Notes

In single lamp modes:

- if the running lamp fails, the other lamp will automatically be switched on.

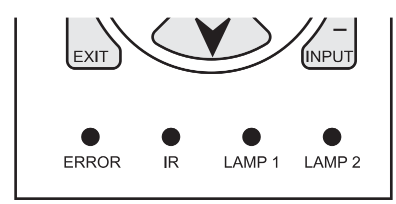
The **Lamp 2** *and* **Alternate** *settings apply only to the 1080p-500. The 1080p-250 has only one lamp.*

The selected lamp mode:

- will not be applied until **OK** *is selected*

- will be applied gradually over a period of 30 seconds

- will not be applied until the end of any warm-up or cool-down period that has already started.



The **Lamp 2** *indicator applies only to the 1080p-500. The 1080p-250 has only one lamp.*

Setup menu continued

On Screen Display

- Press ▲ and ▼ to select On Screen Display.

  Press ▶ to open the On Screen Display submenu.

Menu	ON SCREEN DISPLAY	
Input	OSD Position	Lower Centre
Picture	OSD Size	Large
Geometry	Timeout	30 seconds
Colour		
Setup		
Information		

OSD Position

- Press ▲ and ▼ to select OSD Position

  Press ◀ and ▶ to select from:

  Upper Left

  Upper Centre

  Upper Right

  Middle Left

  Middle Centre

  Middle Right

  Lower Left

  Lower Centre

  Lower Right

OSD Size

- Press ▲ and ▼ to select OSD Size.

  Press ◀ and ▶ to select from:

  Large

  Small

OSD Timeout

- Press ▲ and ▼ to select the length of the On Screen Display Timeout.

  Press ◀ and ▶ to select from:

  0 to 255 in 1 second steps *(when set to zero, the OSD never times out)*

Notes

Setup Menu
On Screen Display

The **On Screen Display** *will move to the centre of the DMD when* **Blanking** *is turned* **On**.

(see **Geometry menu**, *earlier in this section).*

If a menu is opened, and no other key is pressed within the period set in the **OSD Timeout** *menu, then the menus will disappear. When the* MENU *key is pressed again, the menus will reopen at the same point they were last viewed.*

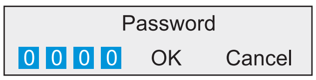
Setup menu continued

Password

Entry to the password protected area is available to authorised service personel only.

- Press and to select Password.

  Press to open the Password control box.



- Press and to select each digit in turn.

  Press and to adjust the digit from:

  0 to 9

  then move to the next digit.

  Use and to select from

  OK

  Press OK to enter the password controlled area.

or Cancel

Press OK or EXIT to exit without applying the password.

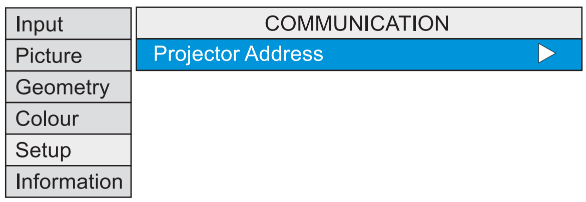
Notes

Setup menu continued

Communication

- Press and to select Comunication.

  Press to open the Comunication submenu.

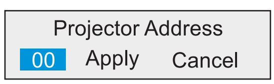


Projector Address

The projector and the remote control need to be set to matching addresses. Read the note to the right on this page, and follow the instructions in the order shown below:

1 Set the projector address:

Press to open the Projector address control box.



Press and to select the address setting.

Press and to adjust the address from:

00 to 99

Use and to select from

Apply

Press OK to apply the new Projector Address.

or Cancel

Press OK or EXIT to exit without making the change.

2 Set the remote control address as shown in **Using the control keys**, earlier in this section.

Notes

Setup Menu
Comunication

When fresh batteries are inserted in the remote control, it will default to address **00***. Remote control* **00** *is a* **master** *control, able to control all projectors.*

FIf two or more projectors are set to the same address, they can be controlled from one remote control, provided they are connected by cable or in range of the infra red.

Setup menu continued

Network

- Press and to select Network.

Press to open the Network submenu.

Input	NETWORK	
Picture	LAN MAC Address	31-FE-A5-81-20-83
Geometry	Connection	Wired ▶
Colour	DHCP	On ▶
Setup	LAN IP Address	192.168.3.6
Information	LAN Subnet	255.255.0.0
	LAN Gateway	192.168.9.10
	Channel	0
	SSID	TITAN

LAN MAC Address

- Projector's unique ID - for information only - cannot be changed.

Connection

- Press and to select Connection

Press to open the Connection control box.

Connection	
Wired	Wireless

Press and to select from:

Wired

Wireless

Press OK to apply the new Connection setting.

Notes

Setup Menu
Network

Some items may be greyed out or not editable, due to the effect of other settings made in the Network submenu.

For example, if a ***Wired Connection*** *is selected:*

Wifi, Channel and SSID will be unavailable.

Setup menu, Network continued

DHCP

- Press and to select DHCP

  Press to open the DHCP control box.

DHCP
On Off

Press and to select from:

On

Off

Press to apply the new DHCP setting.

LAN IP Address

- Press and to select LAN IP Address

  Press to open the LAN IP Address control box.

LAN IP Address
255 255 255 255 Apply Cancel

Use and to select each number in turn.

Use and to adjust the number

then move to the next number.

Use and to select from

Apply

Press to apply the new LAN IP Address.

or Cancel

Press or to exit without making the change.

Notes

LAN IP Address *cannot be changed if* **DHCP** *is set to* **ON**.

DHCP will set the the address, which will be displayed for information only.

Setup menu, Network continued

LAN Subnet Mask

- Press and to select LAN Subnet

  Press to open the LAN Subnet control box.

  LAN Subnet
  255.255.255.254 Apply Cancel

  Press and to select from:

  Automatic

  or one of the following:

  Class C Masks

  255.255.255.254
  255.255.255.252
  255.255.255.248
  255.255.255.240
  255.255.255.224
  255.255.255.192
  255.255.255.128
  255.255.255.0 (selected when setting is Automatic and IP class is C)

  Class B Masks

  255.255.254.0
  255.255.252.0
  255.255.248.0
  255.255.240.0
  255.255.224.0
  255.255.192.0
  255.255.128.0
  255.255.0.0 (selected when setting is Automatic and IP class is B)

  Class A Masks

  255.254.0.0
  255.252.0.0
  255.248.0.0
  255.240.0.0
  255.224.0.0
  255.192.0.0
  255.128.0.0
  255.0.0.0 (selected when setting is Automatic and IP class is A)

  Use and to select from

  Apply

  Press OK to apply the new LAN Subnet Mask.

or Cancel

  Press OK or EXIT to exit without making the change.

Notes

LAN IP Subnet *cannot be changed if* **DHCP** *is set to* **ON**.

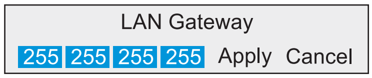
DHCP will set the the subnet mask, which will be displayed for information only.

Setup menu, Network continued

LAN Gateway Mask

- Press ▲ and ▼ to select **LAN Gateway**

  Press ▶ to open the **LAN IP Address** control box.



Use ◀ and ▶ to select each number in turn.

Use ▲ and ▼ to adjust the number

then move to the next number.

Use ◀ and ▶ to select from

Apply

Cancel

Press OK to apply the new LAN Gateway Mask, or to exit without making the change.

Notes

LAN IP Gateway *cannot be changed if* **DHCP** *is set to* **ON**.

DHCP will set the the gateway mask, which will be displayed for information only.

Setup menu, Network continued

Channel

- Press ⋀ and ⋁ to select Channel.

  Press ➤ to open the Channel control box.

  Channel
  0 Apply Cancel

  Press ◀ and ➤ to select the channel number.

  Use ⋀ and ⋁ to adjust the channel number from:

  0 to 14

  Use ◀ and ➤ to select from

  Apply

  Press OK to apply the new Channel number.

or Cancel

  Press OK or EXIT to exit without making the change.

SSID

- *Projector's ID - for information only.*

Notes

☞ *The* **Channel** *setting is not available if* **Connection** *is set to* **Wired***.*

Setup menu, continued

Restore Defaults

- Press ▲ and ▼ to select Restore Defaults.

  Press ➤.

  The following message will be displayed.

Restore Defaults?	
Yes	No

Press ◀ and ▶ to select from:

Yes

Press OK to confirm your that you really wish to restore all default settings.

- All settings will be restored to factory defaults.

or No

Press OK or EXIT to exit without making the change.

Notes

Restore Defaults will restore all settings to factory defaults.

If you are not sure this is what you want to do, then either:

make a record of all settings first

or

select **No**, then press OK.

Following a restore to factory defaults, the projector will perform a self-test and enter Standby mode.

This process will take up to 10 seconds. During this time the projector will not respond to any commands.

When complete, all settings will be restored to factory condition and all user settings will be removed except for downloaded colour and gamma parameters.

Information menu

*To return to the **main menu**, press EXIT up to three times.*

From the main menu:

- Press ∧ and ∨ until Information is highlighted.

  Press > to open the Information menu. The blue highlight moves to the first item in the menu.

Input	Projector ▶
Picture	Source ▶
Geometry	Digital Projection ▶
Colour	
Setup	
Information	

Projector Information

- Press ∧ and ∨ to select Projector Information.

  Press > to open the Projector Information submenu.

	PROJECTOR INFORMATION
Input	Power On Time 11h:55m
Picture	Lamp 1 Time 5h:11m Strikes 25
Geometry	Lamp 2 Time 12h:43m Strikes 36
Colour	Electronics Version: m102684ai (F8)
Setup	Software Version: 2.00 8-dec-2006
Information	Projector Address: 00
	Projector Model: Titan
	Projector Serial Number: DP01234
	Configuration: 01~000~01

Source Information

- Press ∧ and ∨ to select Source Information.

  Press > to open the Source Information submenu.

	SOURCE INFORMATION
Input	Input: DVI
Picture	Standard: 720p 60
Geometry	Frequency V: 60Hz H: 45.0KHz
Colour	
Setup	
Information	

Notes

When using the menus, press **OSD** OFF *or* ON *to hide or reveal the On-Screen-Display.*

Information Menu

Information Menu
Projector Information

*The **Lamp 2** information applies only to the 1080p-500. The 1080p-250 has only one lamp.*

Information Menu
Source Information

Information menu continued

Digital Projection Information

- Press ⮝ and ⮟ to select Digital Projection.

  Press ➤ to see the DP Information screen.



Notes

When using the menus, press **OSD** (OFF) *or* (ON) *to hide or reveal the On-Screen-Display.*

Information Menu
DP Contact Information

5. Userware

Contents

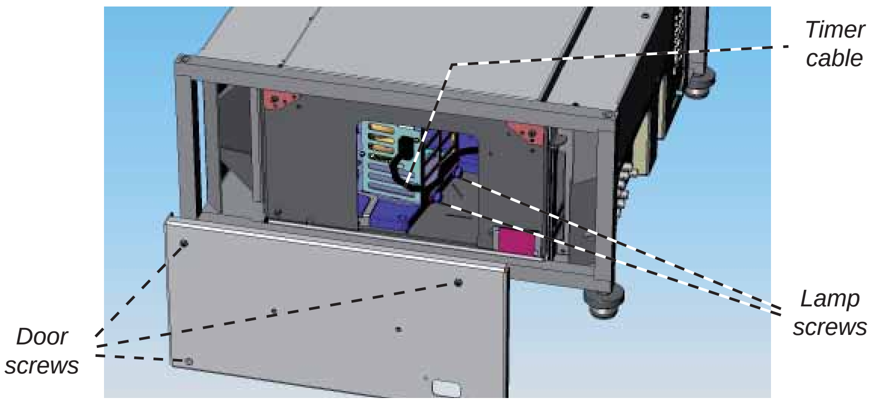
6. Maintenance

Contents

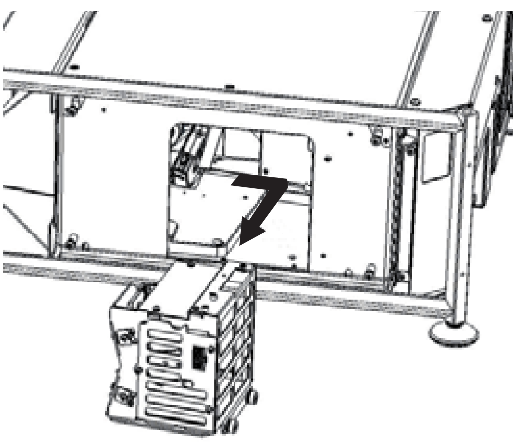
Changing the lamp module *6.2*
Changing the air filter *6.3*
Cleaning *6.4*
Projector *6.4*
Lens *6.4*
Lamp module *6.4*

Changing the lamp module

- Turn the power OFF and allow the lamp to cool for 5 minutes.
- Unscrew the three door screws, and detach the rear door - the door is tethered, so cannot be removed completely.



- Disconnect the timer cable from the lamp module.
- Loosen the two captive finger screws securing the lamp module.
- Pull the lamp module to the right, then to the rear to remove it from the projector.



- Insert a new lamp module, manoeuvreing it carefully so that the plug on the top of the module mates properly with the socket in the roof of the cabinet.
- Tighten the two lamp fixing screws.
- Reconnect the timer cable.
- Re-fit the rear door, making sure that the door tether is not trapped, and tighten the four screws.

Notes

Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp

There are no user-serviceable parts inside the lamp module. The whole module should be replaced.

At the end of life, the lamp will not strike, and the Lamp Indicator on the control panel will show red. (Typical lamp life is 1500 hours)

Do not use the lamp for more than 1500 hours, as this may cause serious lamp failure, damage the lamp module and cause extra cost on replacement.

Take care not to touch the glass surface of the lamp module. If you do accidentally touch the glass, it should be cleaned before use.

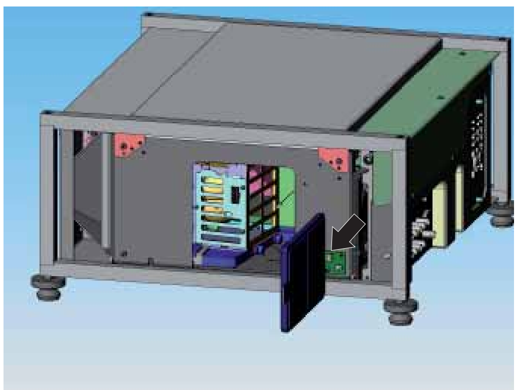
HID lamps produce high intensity light. Do not look directly at the light coming from the lamp housing or the lens.

The filter should be changed at the same time as the lamp is changed - see next page.

The projector cannot be operated until the door is fully closed.

Changing the air filter

- Turn the power OFF and allow the lamp to cool for 5 minutes.
- Unscrew the three door screws, and remove the rear door.
- Pull out the air filter.
- Fit a new air filter.
- Re-fit the rear door, making sure that the door tether is not trapped, and tighten the three screws.



Notes

Always allow the lamp to cool for 5 minutes before:

- disconnecting the power
- moving the projector
- changing the lamp

The air filter should be changed regularly:

- In a clean environment such as an office, change after 1500 hours, at the same time as the lamp is changed.

- In a dusty or smoky environment such as a theatre or public area, more frequent changes may be necessary.

Opening the rear door will switch the projector OFF.

The projector cannot be operated until the door is fully closed.

Cleaning

Turn the projector off before cleaning.

Projector

Clean the cabinet periodically with a damp cloth. If heavily soiled, use a mild detergent.

Lens

Use a blower or lens paper to clean the lens, taking care not to scratch the glass.

Lamp module

Use a blower or lens paper to clean ONLY the glass window, taking care not to scratch the glass.

Notes

Never use strong detergents or solvents such as alcohol or thinners to clean the projector and lens.

NEVER touch the lamp or reflector.

7. Appendix

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Troubleshooting

Problem	*Possible solutions*
The projector will not power up.	Check that the mains plug is plugged in and that the mains supply is switched on. Check any external fuses or breakers.
The projector shuts down after it has been in use for some time.	The projector may be overheating. Check that the air inlets and outlets are clear of any obstruction. Check that the air filter is clean, and if it is dirty, fit a new one. See **section 1. Introduction, Getting to know the projector**
No image is displayed.	Check the lamp indicators on the control panel. If both indicators on the HD-500 are red, then both lamps are faulty. (The HD-250 has only one lamp.) See **section 5. Maintenance, Changing the lamp** Check that the input source is switched on and connected to the projector correctly. Check that the correct image source is selected. See **section 4. Controlling the projector, Using the control keys and Input menu** Check that the brightness and contrast settings are set correctly. See **section 4. Controlling the projector, Picture menu** The projector may be overheating. Check that the air inlets and outlets are clear of any obstruction. Check that the air filter is clean, and if it is dirty, fit a new one.
The image does not fit the screen correctly.	Check that the correct lens is being used for the combination of screen size and projection distance, and that the zoom is adjusted correctly. See **section 2. Installation, Choosing a lens** Check the image size settings. See **section 4. Controlling the projector, Picture or Geometry menus**
Uneven image quality.	Check that the projector is parallel to the screen. Check that the screen is flat, and securely mounted.

Problem	***Possible solutions***
Projector does not respond to control commands from a computer.	Check that the LAN or serial cable is connected correctly. See **this section 7. Appendix, Connections** If using a LAN, check that the address setting is made correctly. See **section 4. Controlling the projector, Network menu** If using a serial cable, check that the baud rate is set correctly. See **this section 7. Appendix, Connections** Check that the correct control codes are being used. See **Serial communications protocol** (available from Digital Projection)
Projector does not respond to control commands from the remote control.	If you **are** using a cable, check that the cable is connected properly at both ends, that the cable is not damaged and that the cable is no longer than 50m (150ft). If you are **not** using a cable, check that the infra red windows at the front and rear of the projector are not obstructed. Check that the cable is disconnected from the projector, as this disables the infra red. Check that the batteries are in good condition. Check that the address setting on the remote control is set either to zero, or to the same as the projector. See **section 4. Controlling the projector, Communication menu**
	In the event that this troubleshooting guide has not solved the problem, then contact your Digital Projection dealer or service centre.

Specifications

Part numbers

Projector, 1080p-500	106-241
Projector, 1080p-250	106-242
Rigging frame	104-923
Power cable 10A, Europe	102-163
Power cable 13A, North America	102-165
Power cable 10A, United Kingdom	102-180
Remote control	105-023
4x AAA batteries	105-922
Remote cable 5m	102-162
User manual on CD	105-923D
Important Information	105-924C

Replacement parts

Lamp module, 1080p-500	001-742
Lamp module, 1080p-250	102-246
Air filter	102-064

Lenses

	High Brightness	High Contrast
0.67 : 1 fixed lens	105-607	107-195
1.12 : 1 fixed lens (3 - 15m)	105-608	105-608
1.12 : 1 zoom lens (1.2 - 2m)	105-609	105-609
1.39 - 1.87 : 1 zoom lens	105-610	107-196
1.87 - 2.56 : 1 zoom lens	105-611	107-197
2.56 - 4.16 : 1 zoom lens	105-612	107-198
4.16 - 6.96 : 1 zoom lens	105-613	107-199

Optical

Digital Light Processor	3 x 0.95” Texas Instruments DMD™, resolution 1920 x 1080 pixels
Contrast Ratio	
1080p-500	>2000:1 full field (±10%)
1080p-250	>5000:1 full field (±10%)
Pixel fill factor	87%
Lamp power	
1080p-500	2 x 250W
1080p-250	1 x 250W
Lamp life (typical)	
1080p-500	1500 hours in dual lamp mode, 3000 in single lamp mode
1080p-250	1500 hours in single lamp mode
Brightness	
1080p-500	6000 ANSI lumens (±10%) in dual lamp mode
1080p-250	2000 ANSI lumens (±10%)
Colour temperature	Native: 7500°K (±1000°K), White balance adjustment: 3000°K - 10000°K

Electrical

Inputs	RGB1, RGB2, DVI, Composite Video, S-Video, Component
Pixel clock	up to 165MHz
Control inputs	1 x LAN 1 x wifi LAN 1 x RS232 serial: 19200 baud, 8 bits, 1 stop bit, no parity 1 x remote control
Mains voltage	100-240 VAC ±10%, 48-62Hz (single phase)
Power consumption	
1080p-500	750 W
1080p-250	500W
International Regulations	Meets FCC Class A requirements Meets EMC Directives (EN 55022, EN 55024, EN 55103) Meets Low Voltage Directive (EN60950)
Indicators	Power, Shutter, Error, IR, Lamp 1, Lamp 2 (1080p-500 only)

Physical

Operating Temperature	0 to 40°C
Storage Temperature	-10 to 50°C
Thermal Dissipation	
1080p-500	2600 BTU/hr
1080p-250	1733 BTU/hr
Operating Humidity	20% to 80% non-condensing
Weight	approximately 27 kg (50 lbs)

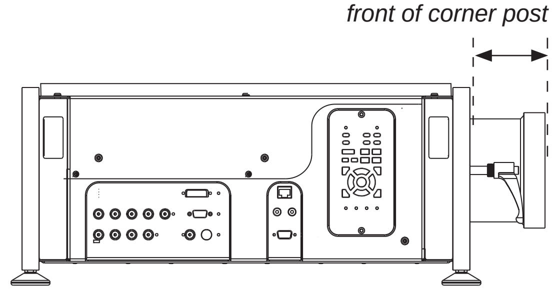
FCC WIFI ID
R68WIPORT

Lens Data

Optical	105-607 ~ 107-195	105-608	105-609	105-610 ~ 107-196
throw ratio	**0.67 : 1 fixed**	**1.12 : 1 fixed**	**1.12 : 1 fixed**	**1.39 - 1.87 : 1 zoom**
full DMD image width	***0.67 : 1*** 1.64 - 4.78m (5.4 - 15.7ft)	***1.12 : 1*** 2.68 - 13.39m (8.8 - 43.9ft)	***1.12 : 1*** 1.07 - 1.79m (3.5 - 5.9ft)	***1.39 : 1*** 2.88 - 17.27m (9.4 - 56.7ft) ***1.87 : 1*** 2.14 - 12.83m (7 - 42.1ft)
throw distance	***0.67 : 1*** 1.1 - 3.2m (3.6 - 10.5ft)	***1.12 : 1*** 3 - 15m (9.8 - 49.2ft)	***1.12 : 1*** 1.2 - 2m (3.9 - 6.6ft)	***1.39 : 1*** 4 - 24m (13.1 - 78.7ft) ***1.87 : 1*** 4 - 24m (13.1 - 78.7ft)
*lens shift vertical in pixels** *(vs DMD height)*	no shift possible	no shift possible	no shift possible	+702, -351 (+0.65, -0.33H)
*lens shift horizontal in pixels** *(vs DMD width)*	no shift possible	no shift possible	no shift possible	±288 (±0.15W)
Aperture	F/2.5	F/2.5	F/2.5	F/2.5
Max object field size	26.1mm (1.03”)	34.6mm (1.36”)	to be confirmed	34.6mm (1.36”)
Effective focal length	14.6mm (0.58”)	23.55mm (0.93”)	to be confirmed	28.94 - 38.95mm (1.14 - 1.53”)
Distortion	<0.3%	<0.5%	to be confirmed	<0.5%
Transmission	>85%	>88%	to be confirmed	>88%
Mechanical				
*Lens extension***	204 mm (8.0 in)	268 mm (10.6 in)	268 mm (10.6 in)	194 mm (7.6 in)
Length	361 mm (14.2 in)	422 mm (16.6 in)	422 mm (16.6 in)	345 mm (13.6 in)
Maximum diameter	163 (6.4 in)	169 mm (6.7 in)	169 mm (6.7 in)	139 mm (5.5 in)
Weight	to be confirmed	to be confirmed	to be confirmed	to be confirmed

* Actual available lens shift is reduced when the lens is to be shifted in two directions combined (see **Shifting the image**, in **section 2. Installation**).

** Lens extension is the distance from the outer end of the lens to the front of the projector. It is measured when the lens is focussed at infinity and fully extended. At other focus settings, the extension could be up to 10mm less. It is important for calculating throw distance accurately (see **Useful lens calculations,** in **section 2. Installation**).

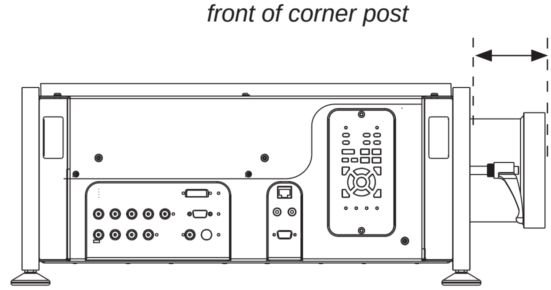


Optical	105-611 ~ 107-197	105-612 ~ 107-198	105-613 ~ 107-199
throw ratio	**1.87 - 2.56 : 1 zoom**	**2.56 - 4.16 : 1 zoom**	**4.16 - 6.96 : 1 zoom**
full DMD image width	***1.87 : 1*** 2.14 - 12.83m (7 - 42.1ft) ***2.56 : 1*** 1.56 - 9.38m (5.1 - 30.8ft)	***2.56 : 1*** 3.55 - 17.58m (11.6 - 57.7ft) ***4.16 : 1*** 2.19 - 10.82m (7.2 - 35.5ft)	***4.16 : 1*** 2.88 - 19.23m (9.4 - 63.1ft) ***6.96 : 1*** 1.72 - 11.49m (5.6 - 37.7ft)
throw distance	***1.87 : 1*** 4 - 24m (13.1 - 78.7ft) ***2.56 : 1*** 4 - 24m (13.1 - 78.7ft))	***2.56 : 1*** 9.1 - 45m (29.9 - 147.6ft) ***4.16 : 1*** 9.1 - 45m (29.9 - 147.6ft)	***4.16 : 1*** 12 - 80m (39.4 - 262.5ft) ***6.96 : 1*** 12 - 80m (39.4 - 262.5ft)
*lens shift vertical in pixels** *(vs DMD height)*	+702, -351 (+0.65, -0.33H)	+702, -351 (+0.65, -0.33H)	+702, -351 (+0.65, -0.33H)
*lens shift horizontal in pixels** *(vs DMD width)*	±288 (±0.15W)	±288 (±0.15W)	±288 (±0.15W)
Aperture	F/2.5	F/2.5	F/2.5
Max object field size	34.6mm (1.36”)	34.6mm (1.36”)	34.6mm (1.36”)
Effective focal length	39.0 - 53.43mm (1.54 - 2.1”)	52.4 - 85.3mm (2.06 - 3.36”)	84.86 - 142.03mm (3.34 - 5.59”)
Distortion	<0.5%	<0.5%	<0.5%
Transmission	> 88 %	> 88 %	> 88 %
Mechanical			
*Lens extension***	159 mm (6.3 in)	152 mm (6.0 in)	118 mm (4.6 in)
Length	311 mm (12.2 in)	304 mm (12.0 in)	271 mm (10.7 in)
Maximum diameter	139 mm (5.5 in)	139 mm (5.5 in)	139 mm (5.5 in)
Weight	to be confirmed	to be confirmed	to be confirmed

* Actual available lens shift is reduced when the lens is to be shifted in two directions combined (see **Shifting the image**, in **section 2. Installation**).

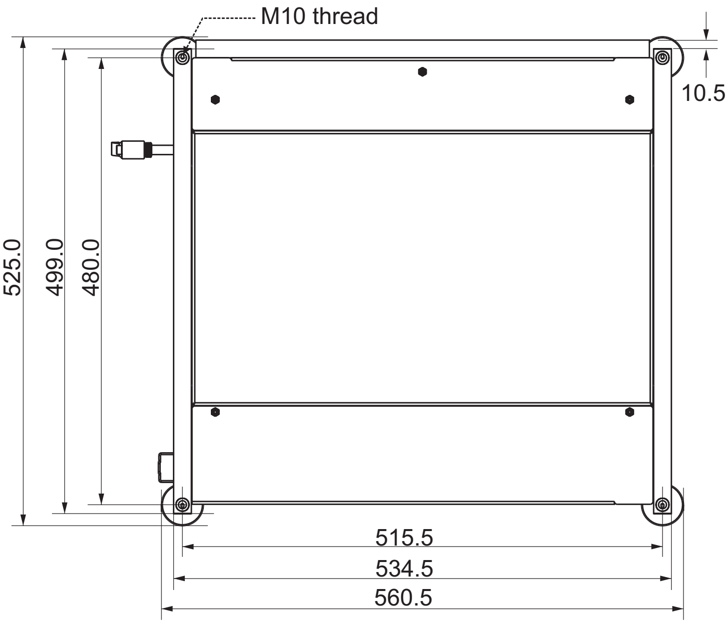
** Lens extension is the distance from the outer end of the lens to the front of the projector. It is measured when the lens is focussed at infinity and fully extended. At other focus settings, the extension could be up to 10mm less. It is important for calculating throw distance accurately (see **Useful lens calculations,** in **section 2. Installation**).

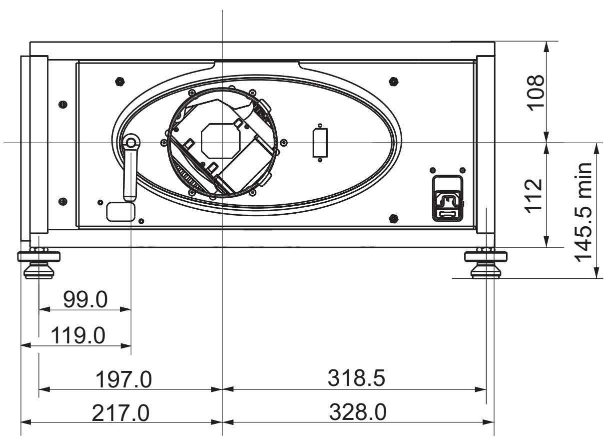
lens extension, measured from front of corner post

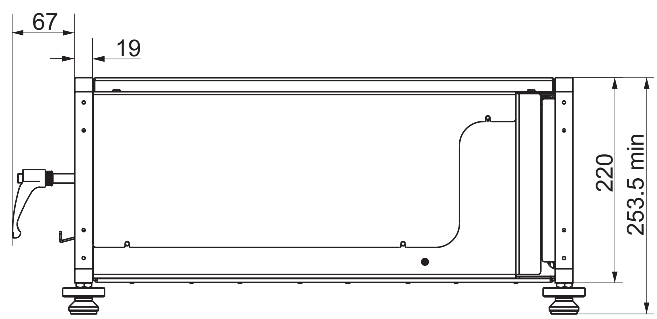


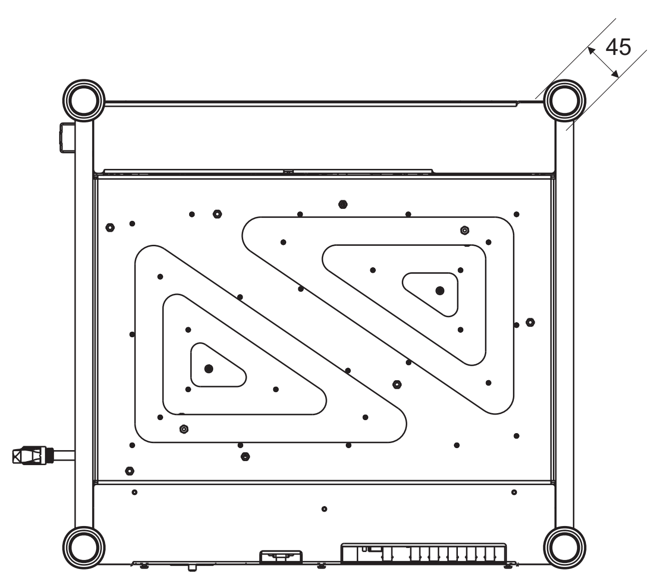
Dimensions

All dimensions in mm unless otherwise stated









Input modes supported

Signal		Resolution	Refresh Rate (Hz)	Total number of lines	Horizontal Frequency (KHz)	COMPOSITE	S-VIDEO	COMPONENT	RGB1 RGB2	DVI
SDTV	480i	720 x 480	60	525	15.73	✓	✓	✓	✓	✓
	576i	720 x 576	50	625	15.63	✓	✓	✓	✓	✓
HDTV	480p	720 x 480	60	525	31.51				✓	✓
	576p	720 x 576	50	625	31.25				✓	✓
	720p50	1280 x 720	50	750	37.51				✓	✓
	720p60	1280 x 720	60	750	45.00				✓	✓
	1080psf24	1920 x 1080	48	1125	27.00				✓	✓
	1080p24	1920 x 1080	24	1125	27.00				✓	✓
	1080i50	1920 x 1080	50	1125	28.13				✓	✓
	1080p25	1920 x 1080	25	1125	28.13				✓	✓
	1080i60	1920 x 1080	60	1125	33.75				✓	✓
	1080p30	1920 x 1080	30	1125	33.75				✓	✓
	1080p50	1920 x 1080	50	1125	56.24				✓ *	✓ *
	1080p60	1920 x 1080	60	1125	67.48				✓ *	✓ *
COMPUTER	480p	640 x 480	60	525	31.51				✓	✓
	VGA72	640 x 480	72	520	37.86				✓	✓
	VGA75	640 x 480	75	500	37.51				✓	✓
	VGA85	640 x 480	85	509	43.27				✓	✓
	SVGA56	800 x 600	56	625	35.16				✓	✓
	SVGA60	800 x 600	60	628	37.89				✓	✓
	SVGA72	800 x 600	72	666	48.08				✓	✓
	SVGA75	800 x 600	75	625	46.88				✓	✓
	SVGA85	800 x 600	85	631	53.68				✓	✓
	XGA60	1024 x 768	60	806	48.38				✓	✓
	XGA70	1024 x 768	70	806	56.50				✓	✓
	XGA75	1024 x 768	75	800	60.02				✓	✓
	XGA85	1024 x 768	85	808	68.68				✓	✓
	XGA+75	1152 x 864	75	900	67.52				✓	✓
	SXGA-60	1280 x 960	60	1000	60.02				✓	✓
	SXGA-85	1280 x 960	85	1011	85.98				✓	✓
	SXGA60	1280 x 1024	60	1066	64.02				✓	✓
	SXGA75	1280 x 1024	75	1072	80.32				✓	✓
	SXGA85	1280 x 1024	85	1072	91.16				✓	✓
	SXGA+60	1400 x 1050	60	1089	65.32				✓	✓
	SXGA+75	1400 x 1050	75	1099	82.30				✓	✓
	SXGA+85	1400 x 1050	85	1105	93.90				✓	✓
	UXGA60	1600 x 1200	60	1250	75.02				✓	✓

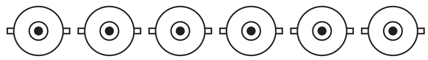
* RGB colourspace only

Input connections

Notes

1. RGB1 input

5 x 75 ohm BNC

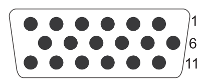


Used for computer, progressive video and analog HD video.

RGsB	RGBS	RGBHV	YCrCb
R	R	R	Pr/Cr
G + Sync	G	G	Y
B	B	B	Pb/Cb
	Sync	H Sync	
		V Sync	

2. RGB2 input

15 way D-type connector

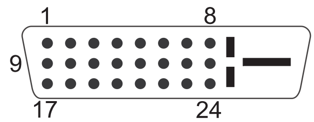


pin view of female connector

	All	RGsB	RGBS	RGBHV	YCrCb
1		R	R	R	Pr/Cr
2		G + Sync	G	G	Y
3		B	B	B	Pb/Cb
4	ID2				
5	Digital Ground				
6	R Ground				
7	B Ground				
8	G Ground				
9	N/C				
10	Digital Ground				
11	ID0				
12	ID1				
13			Sync	H Sync	
14				V Sync	
15	ID3				

3. DVI-D input

24 way D-type connector



pin view of female connector

1 TMDS Data 2-

2 TMDS Data 2+

3 TMDS Data 2 Shield

4 unused

5 unused

6 DDC Clock

7 DDC Data

8 unused

9 TMDS Data 1-

10 TMDS Data 1+

11 TMDS Data 1 Shield

12 unused

13 unused

14 +5 V Power

15 Ground

16 Hot Plug Detect*

17 TMDS Data 0-

18 TMDS Data 0+

19 TMDS Data 0+

20 TMDS Data 0 Shield

21 unused

22 unused

23 TMDS Clock Shield

24 TMDS Clock+

* Hot plug detect (HPD) is fully DVI compliant. DVI sources detect the presence of a display device by providing +5V on pin 14 and looking for +5V on pin 16. Whenever the projector is operational, and 5V is present on pin 14, pin 16 will be held at +5V.

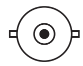
EDID is available even when the projector is switched off.

Operational means that the projector is powered up. Non operational states are powered down and some self test and reprogramming modes.

Notes

4. (not used in this projector)

5. Composite video input

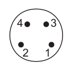


1 x 75 ohm BNC

PAL or NTSC video

6. S-Video input

4 pin mini-DIN



pin view of female connector

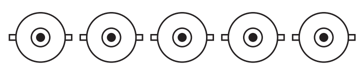
1 L Ground

2 C Ground

3 Lumunance (Y)

4 Chrominance (C)

7. Component video input



4 x 75 ohm BNC

Used for standard definition interlaced signals only

RGsB	RGBS	YCrCb
R	R	Cr
G + Sync	G	Y + Sync
B	B	Cb
	Sync	

Notes

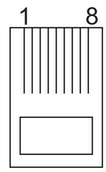
Control connections

LAN connection

10BaseT Unshielded Twisted Pair cable

The standard wire colours as as follows:

1 White / Orange stripe
2 Orange
3 White / Green stripe
4 Blue
5 White / Blue stripe
6 Green
7 White / Brown stripe
8 Brown



top view of cable connector (clip is underneath)

Crossed cable

(used to connect directly to a computer with no hub or network.)
(Note that only the green and orange pairs are crossed)

1	White / Orange stripe	White / Green stripe	1
2	Orange	Green	2
3	White / Green stripe	White / Orange stripe	3
4	Blue Blue		4
5	White / Blue stripe	White / Blue stripe	5
6	Green	Orange	6
7	White / Brown stripe	White / Brown stripe	7
8	Brown	Brown	8

Notes

Use:

- *a straight cable to connect to a hub or network, or*
- *a crossed cable as shown here to connect ONLY to a computer directly.*

Serial control input

1 unused

2 Received Data (RX)

3 Transmitted Data (TX)

4 unused

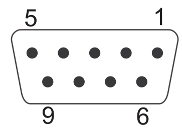
5 Signal Ground

6 unused

7 unused

8 unused

9 unused



pin view of female connector

Null-modem cable

(used to connect the projector to a computer)

RX	2	---	3	TX
TX	3	---	2	RX
GND	5	---	5	GND

Serial port settings

- Baud rate 19,200 bps
- Data length 8 bits
- Stop bits one
- Parity none
- Flow control none

Notes

☞ *The projector is a DTE, so use:*

- *a straight cable to connect to a modem, or*
- *• a null-modem cable as shown here to connect to another DTE such as a computer.*

Remote communications protocol

Version: Revision C 02/01/07

Introduction

This protocol document covers all projectors in the Titan series and also the Lightning 30/40isx+.

Only one remote connection (RS232, LAN or Wireless LAN) should be used at any one time.

Following the transmission of a command, the control system must wait to receive the complete reply before sending a new command.

It should be noted that this protocol is a point to point protocol, and any addressing commands relate to the projector's hand held remote control only.

Message Structure

The data type for all data is raw hexadecimal, and all data larger than 1 byte is formatted little endian i.e. LSB first. There are currently two supported message types:

Operation Messages (message type 03h)
normal projector operations, fixed length message

Enhanced Messages (message type 10h)
projector special functions, variable length message

Responses to all commands start with 1Eh

Notes

☞ *Details of how to connect to the projector, using the serial control input or via a LAN, can be found earlier in this section.*

☞ *The following pages contain an overview of the message structure and examples of some basic Operation commands.*

For full details of all the Operation commands and Enhanced commands, contact Digital Projection at one of the addresses printed near the front of this manual, and ask for a copy of the **Titan Projector Series External Control Protocol**.

Operation Messages

Operation messages are constructed using the following format:

	Header *2 bytes*		**Type** *1 byte*	**Size** *2 bytes*		**CRC** *2 bytes*		**Oper'n type** *1 byte*	**Operation** *2 bytes*		**Reserved** *2 bytes*	
Data	BE	EF	03	19	00	58	58	00	00	00	00	00
Byte #	1	2	3	4	5	6	7	8	9	10	11	12

	Operation Target *4 bytes*				**Operation Value** *4 bytes*				**Reserved** *4 bytes*			
Data	00	00	00	00	00	00	00	00	00	00	00	00
Byte #	13	14	15	16	17	18	19	20	21	22	23	24

	Reserved *4 bytes*				**Reserved** *4 bytes*			
Data	00	00	00	00	00	00	00	00
Byte #	25	26	27	28	29	30	31	32

Header is always EFBEh (byte 1 = BEh and byte 2 = EFh)

Type is always 03h for Operation Messages

Size is always 0019h (byte 4 = 19h and byte 5 = 00h) i.e. 25 bytes after CRC

CRC can be set to 5858h if you want the CRC to be ignored. However, the CRC should ideally be calculated, as described in the **Titan Projector Series External Control Protocol**.

Operation type is one of the following:

Set 01h

Get 02h

Increment 03h

Decrement 04h

Execute 05h

Set writes a value to the projector.

Get reads a value from the projector.

Increment and **decrement** increase or decrease a value by one unit.

Execute executes the current operation (specific commands only).

Spaces in the example messages are for visual clarity and should not be sent as part of the message.

Notes

☞ *The following pages contain examples of some basic Operation commands.*

For full details of all the For full details of all the Operation commands and Enhanced commands, contact Digital Projection and ask for a copy of the **Titan Projector Series External Control Protocol.**

Enhanced Messages

Enhanced messages are constructed using the following format:

	Header *2 bytes*		**Type** *1 byte*	**Size** *2 bytes*		**CRC** *2 bytes*		**Data type** *2 bytes*		**Data length** *(n)* *2 bytes*	
Data	BE	EF	10	XX	XX	58	58	00	00	00	00
Byte #	1	2	3	4	5	6	7	8	9	10	11

	Data *n bytes*			
Data	Data bytes ...	...	...	
Byte #	12	...	...	11 + n

Header is always EFBEh (byte 0 = BEh and byte 1 = EFh)

Type is always 10h for Enhanced Messages

CRC can be set to 5858h if you want the CRC to be ignored. However, the CRC should ideally be calculated, as described in the **Titan Projector Series External Control Protocol**.

Size is always Data Length + 4 (4 bytes after CRC and before data)

Notes

☞ *The following pages contain examples of some basic Operation commands.*

For full details of all the For full details of all the Operation commands and Enhanced commands, contact Digital Projection and ask for a copy of the **Titan Projector Series External Control Protocol.**

Operation Command examples

All operation commands are located at bytes 9 &10.

All values are located at bytes 17 & 18 unless otherwise indicated

Power (0102)

Projector On or Standby

	Value
On	00h
Standby	04h

Examples

Set Projector (On)

BEEF 03 1900 5858 01 0102 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 0102 0000 00000000 00000000 00000000 00000000 00000000

Set Projector (Standby)

BEEF 03 1900 5858 01 0102 0000 00000000 04000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 0102 0000 00000000 04000000 00000000 00000000 00000000

Get Projector Power

BEEF 03 1900 5858 02 0102 0000 00000000 00000000 00000000 00000000 00000000

Response (Projector in Standby)

1E BEEF 03 1900 5858 02 0102 0000 00000000 04000000 00000000 00000000 00000000

Notes

☞ *Spaces in example messages are for visual clarity and should not be sent as part of the message.*

☞ *In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.*

Source (3702)

Projector source select

	Value	
RGB1	00h	
RGB2	01h	
DVI	02h	
SDI	03h	(not used on this projector)
Composite	04h	
SVideo	05h	
Component	06h	

Notes

Spaces in example messages are for visual clarity and should not be sent as part of the message.

In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Examples

Set Source (DVI)

BEEF 03 1900 5858 01 3702 0000 00000000 02000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 3702 0000 00000000 02000000 00000000 00000000 00000000

Set Source (SVideo)

BEEF 03 1900 5858 01 3702 0000 00000000 05000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 3702 0000 00000000 05000000 00000000 00000000 00000000

Get Source

BEEF 03 1900 5858 02 3702 0000 00000000 00000000 00000000 00000000 00000000

Response (SVideo)

1E BEEF 03 1900 5858 02 3702 0000 00000000 05000000 00000000 00000000 00000000

Brightness (E502)

Adjusts Brightness

Range: -128 — +127 (00h - FFh)

Centre (0): 128 (80h)

Notes

☞ *Spaces in example messages are for visual clarity and should not be sent as part of the message.*

☞ *In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.*

Examples

Set Brightness 97 (128 + 97 = 225 = E1h)

BEEF 03 1900 5858 01 E502 0000 00000000 E1000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 E502 0000 00000000 E1000000 00000000 00000000 00000000

Get Brightness

BEEF 03 1900 5858 02 E502 0000 00000000 00000000 00000000 00000000 00000000

Response (97)

1E BEEF 03 1900 5858 02 E502 0000 00000000 E1000000 00000000 00000000 00000000

Increment Brightness

BEEF 03 1900 5858 03 E502 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 03 E502 0000 00000000 00000000 00000000 00000000 00000000

Decrement Brightness

BEEF 03 1900 5858 04 E502 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 04 E502 0000 00000000 00000000 00000000 00000000 00000000

Contrast (*E602*)

Adjusts Contrast

Range: -128 — +127 (00h - FFh)

Centre (0): 128 (80h)

Notes

Spaces in example messages are for visual clarity and should not be sent as part of the message.

In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Examples

Set Contrast 97 (128 + 97 = 225 = E1h)

BEEF 03 1900 5858 01 E602 0000 00000000 E1000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 E602 0000 00000000 E1000000 00000000 00000000 00000000

Get Contrast

BEEF 03 1900 5858 02 E602 0000 00000000 00000000 00000000 00000000 00000000

Response (97)

1E BEEF 03 1900 5858 02 E602 0000 00000000 E1000000 00000000 00000000 00000000

Increment Contrast

BEEF 03 1900 5858 03 E602 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 03 E602 0000 00000000 00000000 00000000 00000000 00000000

Decrement Contrast

BEEF 03 1900 5858 04 E602 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 04 E602 0000 00000000 00000000 00000000 00000000 00000000

***Shutter* (CF02)**

Closes and opens shutter

	Target (Set)	Value (Get)
Shutter Close	00h	01h
Shutter Open	01h	00h

Notes

Spaces in example messages are for visual clarity and should not be sent as part of the message.

In the example messages the CRC is set to 5858h. This value will be ignored. However, the CRC should ideally be calculated, as described in the Titan Projector Series External Control Protocol.

Examples

Set Shutter (Close)

BEEF 03 1900 5858 01 CF02 0000 00000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 CF02 0000 00000000 00000000 00000000 00000000 00000000

Set Shutter (Open)

BEEF 03 1900 5858 01 CF02 0000 01000000 00000000 00000000 00000000 00000000

Response

1E BEEF 03 1900 5858 01 CF02 0000 01000000 00000000 00000000 00000000 00000000

Caution: The Set and Get parameters are different:

Get Shutter

BEEF 03 1900 5858 02 CF02 0000 00000000 00000000 00000000 00000000 00000000

Response (Closed)

1E BEEF 03 1900 5858 02 CF02 0000 00000000 01000000 00000000 00000000 00000000

Response (Open)

1E BEEF 03 1900 5858 02 CF02 0000 00000000 00000000 00000000 00000000 00000000

Quick Reference chart

COMMAND	HEX DATA (MESSAGE LENGTH = 32 BYTES)	COMMENTS
Switch Projector On	BE EF 03 19 00 58 58 **01 01 02** 00 00 00 00 00 00 **00** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Switch Projector to Standby	BE EF 03 19 00 58 58 **01 01 02** 00 00 00 00 00 00 **04** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select RGB1 input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **00** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select RGB2 input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select DVI input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select SDI input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **03** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	not used on this projector
Select Composite input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **04** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select SVideo input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **05** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select Component input	BE EF 03 19 00 58 58 **01 37 02** 00 00 00 00 00 00 **06** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to Native	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **00** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to Fill	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to USER	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **10** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 1.33:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **14** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 1.25:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **15** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 1.78:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **16** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 2.35:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **17** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 1.66:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **18** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set aspect ratio to 1.85:1	BE EF 03 19 00 58 58 **01 7A 02** 00 00 00 00 00 00 **19** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select 0% field test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **06** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select 20% field test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **07** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select 80% field test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **08** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select 100% field test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **09** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select chequerboard test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **0C** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select colour bars test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select grid test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **0E** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Select screen layout test pattern	BE EF 03 19 00 58 58 **01 7D 02** 00 00 00 00 00 00 **0F** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Turn test patterns off	BE EF 03 19 00 58 58 **05 8F 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Blank display	BE EF 03 19 00 58 58 **01 87 02** 00 00 00 00 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Displays a black field (OSD still visible)
Unblank display	BE EF 03 19 00 58 58 **01 87 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set Brightness	BE EF 03 19 00 58 58 **01 E5 02** 00 00 00 00 00 00 **XX** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	XX = required brightness. 00h = -128, 80h = 0, FFh = +127
Increment Brightness	BE EF 03 19 00 58 58 **03 E5 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Decrement Brightness	BE EF 03 19 00 58 58 **04 E5 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set Contrast	BE EF 03 19 00 58 58 **01 E6 02** 00 00 00 00 00 00 **XX** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	XX = required contrast. 00h = -128, 80h = 0, FFh = +127
Increment Contrast	BE EF 03 19 00 58 58 **03 E6 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Decrement Contrast	BE EF 03 19 00 58 58 **04 E6 02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Shutter close	BE EF 03 19 00 58 58 **01 CF 02** 00 00 **00** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Closes optical shutter
Shutter open	BE EF 03 19 00 58 58 **01 CF 02** 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Opens optical shutter
Set lamp mode to Dual	BE EF 03 19 00 58 58 **01 C5 02** 00 00 00 00 00 00 **00** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set lamp mode to Alternate	BE EF 03 19 00 58 58 **01 C5 02** 00 00 00 00 00 00 **01** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set lamp mode to Single 1	BE EF 03 19 00 58 58 **01 C5 02** 00 00 00 00 00 00 **02** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Set lamp mode to Single 2	BE EF 03 19 00 58 58 **01 C5 02** 00 00 00 00 00 00 **03** 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	